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ORIGINAL ARTICLES.

ULCER AND CANCER OF THE STOMACH FROM A SURGICAL STANDPOINT.

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THE most important subject before the medical profession to-day is that of diseases of the stomach. Heretofore they have been considered almost entirely from a medical point of view and it is only of late that their surgical possibilities are beginning to be recognized.

The treatment of gastric disorders has been based upon chemistry, and for two decades hydrochloric acid and pepsin have formed the chief ammunition which has been fired at diseases of the stomach. During this time there has gradually developed a feeling that these means were inefficient and while many have turned toward new pharmacopeal combinations, there has also been an intelligent effort, not toward drugs, but rather to a better understanding of the functions of the stomach, and with this a different theory as to its pathology. It is the mechanics of the stomach which is usually at fault and not its chemics, and it is for this reason that surgery is rapidly invading the field. I would not be understood as saying that even the greater proportion of diseases of the stomach are surgical; but that the majority of serious lesions may become so can not be doubted, and it is also true that a very large proportion of chronic gastric disorders are due to faulty mechanics and must call surgery to their aid.

The stomach can be aptly compared to the magazine of a coal-stove into which at intervals there is rapidly placed a quantity of material for digestion. While it absorbs fluids and equalizes the temperature of the ingesta, it does not *digest* the food; but with a weak solution of pepsin and hydrochloric acid it *macerates* the ingested material, and the pyloric portion breaks up the food masses by a grinding motion. As the process is completed the product is turned into the small intestine where digestion and assimilation is accomplished.

The muscular action of the stomach is of a twofold nature, the fundus contracts rather slowly upon the food material, forcing it toward the pyloric ends, which grinds and pulverizes it into a harmonious whole, the fundus being the hopper, and the pyloric portion the grind stones. It can readily be seen that an obstruction at the outlet produces dilatation with retention or stagnation of the food, and this often results in fermentation and absorption of deleterious products. The extent of the disorder depends upon the degree of obstruction and the compensatory hypertrophy of the musculature of the stomach. Many of these cases develop a degree of hypermotility which equalizes the obstruction. In other cases a period of compensation alternates with muscle failure, exactly like valvular heart lesions and their effect upon the cardiac muscle. We see the same phenomena in obstructions at the outlet of the gall-bladder, and at the pelvis of the kidney, and again in the urinary bladder—all organs with a temporary storage function and a limited outlet. Even with moderate obstructive dilatation the victim begins to diet and in the main "diet" means restricted food supply, the attempt being to reduce the amount of work to be done to the minimum. In the extreme cases, the solids are first eliminated from the dietary because, as has been pointed out, the stomach does not assimilate such articles of food and the bulk increases the difficulty of passing the obstruction. Fluids, on the contrary, are absorbed to a certain degree in the stomach and also more easily pass the contracted outlet. Therefore, foods with much fluids and little residue are chosen.

The stomach may become enormously distended and even the absorption of fluids be reduced to small proportions. So true is this, that Crämer was able to demonstrate by the quantity of urine passed, the degree of dilatation and the amount of gastric function. He divides these cases into three grades, as shown by the urine collected for twenty-four hours. First degree, 1,500 to 1,000 c.c.; second, from 900 to 500 c.c., and third, all cases falling below 500 c.c., and further says that lavage of the stomach which contains much material, with urine below 500 c.c., may dilute the toxic products in the stomach and render them more readily absorbable. Tetany has its onset immediately following the use of the tube in many reported cases. The stomach should be emptied some hours before lavage is practised in such cases. That these products of retention and fermentation are poisonous cannot be questioned. We had one case in which gastro-enterostomy turned a great amount of such material into the small bowel and the patient promptly died from toxemia, which followed the absorption. The symptoms resembled the effect of cadaverin upon animals. Gastric tetany probably depends for its origin upon the absorption of retention products. The severe grades are the only ones which we have heretofore recognized. They have been exceedingly serious, as Albu in forty cases found thirty-one deaths. Mild grades, however, are much more common and apt to be overlooked. Muscle twitching, prickling sensations and so forth in connection with serious dilatation are to be looked upon as a warning and surgery should not be long delayed. Crämer has recently written exhaustively upon this subject.

The popularity of the stomach tube depends upon the mechanical removal of food remnants which would otherwise stagnate in the stomach; but it does not cure any more than the catheter used to relieve urinary retention or residual urine, cures the prostatic hypertrophy upon which the condition depends. It relieves the temporary obstruction and may aid restoration of compensation by giving time for muscular development; but our faith in the ability of gastric lavage, either plain or medicated, to cure mechanical obstructions has been shattered beyond repair.

It is not my purpose to discuss in detail the nature of the various obstructions, but rather to indicate the effect of such interference upon gastric motility and to call attention to the fact that serious or progressive obstructions are surgical conditions and that dilatation of the stomach and its degree is the sign post which tells us the proper course of action. If the lesser curvature is in normal position and the greater curvature of the stomach lies below the umbilicus, some degree of dilatation is present. If the stomach is prolapsed, the distance between the curvatures, demonstrated by air inflation, will readily show the amount of dilatation. The tartaric acid and bicarbonate of soda test is sudden and in certain cases has danger of rupturing a weakened gastric wall. With an ordinary Davidson syringe or bicycle pump and a stomach tube, the stomach can be easily filled with air and its outline marked upon the skin. Crämer says that any dilatation not vastly improved in four weeks under gastric lavage, dietary and massage for muscle building, should be subjected to operation. Loss of stomach motility in its lesser degrees, is not necessarily obstructive. For instance, in gastric atony and in the neurasthenic state, loss of motility is not infrequently neurotic in origin and often accompanied by hyperchlorhydria. These conditions carry with them stigmata that will not be easily overlooked and stagnation and retention of food does not occur for any length of time in such cases.

Turning from the most common causes of interference with the function of the stomach, due to obstruction of outflow, we come to the second great class of gastric disorders in which disease of the wall of the stomach prevents its reservoir function or limits its grinding power, that is ulcer and cancer of the stomach. The most common seat of these lesions is in the pyloric portion and they are intimately associated with the etiology of the obstructions, deformities and tumors upon which the dilatation depends. These latter conditions are to be looked upon as a result of ulcer or cancer of the stomach. There are, of course, many other causes of obstruction, such as valve formation at the pylorus, but they are the exceptions which prove the rule.

Ulcer of the Stomach.—Simple ulcer of the stomach is by no means the rare condition which we have been led to believe. The acute form with its classical symptoms, pain, vomiting, hemorrhage, local tenderness and hyperchlorhydria form a group of symptoms which is readily recognized, and the treatment is purely medical. Surgery has only to do with the complications, such as hemorrhage or perforation. It is altogether probable that the vast majority of acute ulcers heal, but a considerable minority fail to do so and constitute a share of the chronic ulcers.

Acute exacerbations of a chronic ulcer must not be mistaken for acute ulcer as is too often done, and the subsidence of the acute period taken for cure of the original condition. Chronic ulcer is frequently, if not usually, chronic from its inception, its course being marked by a period of symptoms lasting from a few days to weeks, to be followed by a longer period of apparent betterment, lasting some weeks or months. These patients go from one physician to another, each acute attack a medical cure, it is the old story of appendicitis and gallstones over again. Failure to stay well impels the victim to seek new aid and often enough each physician believes the cure to have been permanent. Ultimately the patient, unrelieved by legitimate medicine, much to our disgust, takes to the charlatan and patent medicine vender. These cases are surgical. They are chronic because treatment has been tried over and over again and has failed.

Etiology.—The etiology of gastric ulcer is obscure. There are three known factors of great importance: first, anemia; second, hyperchlorhydria; and third, mechanical injury. Anemia is certainly a very important element, particularly at the inception of the disease, a cute round ulcer being by no means a rare occurrence in the chlorotic state and the overcoming of the anemia often does much to establish a cure. In the chronic forms this anemia may be continued and depend upon a slow loss of blood. Murphy has pointed out its close resemblance to the pernicious type. In some cases the post mortem is the only way the diagnosis has been cleared up.

Hyperchlorhydria usually exists at some time in the history of peptic ulcer and in most cases at all times. That it is of the utmost etiological importance is shown by the frequency of duodenal ulcers of the peptic type above the opening of the common duct, with its alkaline discharges, and the occurrence of secondary peptic ulcer in the jejunum at or near the opening made by gastroenterostomy for drainage of gastric ulcer.

Mechanical injury is also an important factor as shown by the location of 75 per cent. of gastric ulcers in the grinding apparatus of the pyloric end of the stomach, although having not more than one-sixth of the exposed mucous membrane. It is for this reason that gastrojejunostomy has given such signal relief. The anemia is overcome by good feeding, the hyperchlorhydria by the rapid drainage of the gastric juices into the intestine with its alkaline secretions, and lastly the avoidance of irritating the ulcer by the passage of food over its sensitive surface.

Ulcer of the Duodenum.—Chronic ulcer of the duodenum should be classed with gastric ulcer and occurs in the first 2½ inches of the intestine.

It is essentially a disease of adult males. In 39 cases which have come under our care at the operating table, 32 were in males. In proportion to its frequency it is even more liable to perforation than gastric ulcer but also more frequently walled off because of its anatomical relations and its more fixed position. In some instances the symptoms of chronic duodenal ulcer cannot be distinguished from gall-stone disease, the location and the colics being strongly suggestive of biliary calculi. We have on several occasions operated for gall-stones and found duodenal ulcer. The pain and local tenderness, however, usually lasts longer in the latter disease. Of the combined series of gastric and duodenal ulcers which occurred in our experience, 12 per cent were duodenal, 88 per cent. gastric.

Symptomatology of Gastric and Duodenal Ulcer.—The symptoms of chronic ulcer are variable, but the chief one is pain,—painful digestion, not all the time, perhaps, nor at every meal; but a feeling of discomfort a considerable part of the day and at times severe cramp-like pains which in ulcer of the pylorus may amount to a sharp colic. If the ulcer extend to the peritoneum, symptoms of regional peritonitis may come on, lasting several days or, more rarely, leading to unprotected perforation. Points of perforation are usually protected, as shown by the frequency of extensive adhesions. Fortunately, in the large majority of cases of gastric and duodenal ulcer, the secretions are excessively acid, therefore relatively sterile, and general infection is less liable to occur than further down the intestinal canal. Vomiting is a late symptom and depends upon a complicating stenosis in the majority of instances. Hemorrhage in appreciable quantities is rare, although many anemias depend upon a continuous small loss of blood. As the majority of symptom producing ulcers are in the pyloric end of the stomach, the syndrome of Hartmann is usually present, that is, pain, hyper-secretion, gas and indigestion. Ulcers in the body of the stomach are frequently latent and the first knowledge of their existence may be a fatal perforation. Welch, in 793 cases, found 235 posterior, 288 lesser curvature, 96 anterior wall, 95 pyloric ring, while only 29 were found in the fundus and 27 along the greater curvature. It is interesting and surgically very important to note that in at least 20 per cent. of cases, more than one ulcer is present. A frequent combination is one ulcer anterior and another facing it on the posterior wall, or one or more ulcers of the stomach and one of the duodenum. Brinton, in 463 autopsies upon cases with ulcer of the stomach, found 57 with two ulcers, 16 cases with three or four, two cases with five and four cases with more than five.

Chronic ulcer is a disease of adult life and is comparatively rare in youth. The small, round and fissure ulcer is most frequent in the female, while the large irregular ulcer is more common in males. Friedler, in 2,200 autopsies found 20 per cent. of the female bodies with evidences of ulcer, and only 1.5 per cent. of men. Berthold, in 262 autopsies of ulcer cases, found 134 women and 128 men. Welch, in 793 autopsy findings, gave 60 per cent. women and 40 per cent. men, and this latter agrees very closely with our experience in somewhat over 300 operated cases. The series of large chronic irregular ulcers tabulated by Seymour Taylor gave 72 males and 28 females. This also agrees with our experience, although the preponderance of males was not so great.

The diagnosis of chronic ulcer is essentially clinical. The history and the physical examination, including outlining the stomach by air distention with the use of the stomach tube to develop stagnation or retention, give the most important evidence. The laboratory findings, while not worthless, are often contradictory and misleading. In over 1,500 cases which have been examined by my colleagues, Drs. Graham and Millet, 478 came to operation. The only test which had even corroboratory worth was that high values for hydrochloric acid argues for ulcer and low values for cancer; but even this is not to be relied upon. Otherwise, the microscopical and chemical findings, with the exception of the occasional presence of blood, were practically worthless. I do not wish to condemn such attempts for they will lead to great good and should be encouraged by all means; but at the present time we must be careful and not ask the laboratory to make our diagnosis, for if we do, we will ask in vain.

It should not be forgotten that ulcer of the pyloric portion of the stomach may form a well defined tumor and the anemia from chronic blood loss develop a cachexia which, with the tumor, may give the appearance of gastric carcinoma in a hopeless stage. No doubt many of these cases have died from a condition which was essentially benign. We have but to look over the literature to see the frequency of this mistake, a gastro-enterostomy permanently curing a patient in whom a supposed malignant tumor with stenosis proved to be benign.

Prognosis.—The mortality of chronic ulcer is given by Leube at about 25 per cent and he states that about half of the remainder will be cured. Debove and Remond estimate that 25 per cent. die directly from the lesion (hemorrhage perforation and so forth) and 25 per cent. additional from complications, such as tuberculosis induced by the anemia. In 500 cases reported recently at the London hospital, 211 were known to have had previous attacks, 18 per cent. died and 42 per cent. were not cured at the time of discharge, leaving 40 per cent. supposed to have been cured. There is also the further danger of cancer grafting upon ulcer base which is undoubtedly of frequent occurrence, although years may have elapsed between the ulcer and the malignant change. Graham, in 157 cancers of the stomach which came to operation at our hands, found a good ulcer history in over 60 per cent., although perhaps the malignant degeneration developed

years after the ulcer had healed. Futterer, Dunn and many others also insist upon the etiological importance of ulcer in cancer of the stomach.

Surgical Indications.—This leads us directly to the query, When should gastric ulcer be surgically considered? Leube says that from four to five weeks should cure gastric ulcers which can be cured medically. For those cases which have not developed obstructions, it would be best to try a Leube treatment (rectal feeding and so forth), but the bulk of these cases have employed various forms of treatment usually to temporary advantage; but with lack of permanent benefit, and are already in the chronic state. Such cases should be considered surgically and especially so if secondary complications, such as obstruction, dilatation, adhesions and deformities have developed.

Indications for the surgical treatment of gastric ulcer can be divided into two distinct classes; first, the ulcer itself; second, the complicating adhesions, deformities, obstructions and so forth. There are clinically three varieties of gastric ulcer: (*a*) The mucous erosion, limited to the superficial epithelium of the mucous membrane. (*b*) The round and fissure ulcer which is probably the most frequent and is limited to the mucous coat, excepting in perforative cases. It has the distinctive feature that it cannot often be located from the exterior of the stomach, sometimes a little thickening can be felt or some point at which the mucous coat does not glide on the peritoneal and muscular tunics in the normal manner. This variety of ulcer is often multiple and may lead to unpleasantness at the operating table—an ulcer accurately diagnosticated cannot be demonstrated to the mortification of the surgeon. (*c*) The large irregular ulcer invading all the coats of the stomach and easily recognizable by its thickness and the milky or opaque appearance of the peritoneum. This variety is often mistaken for cancer, especially as enlarged lymph nodes are to be found in the omenta, particularly in the gastrocolic omentum as pointed out by Lund.

The complications of gastric ulcer are many. For instance, adhesions, the separation of which may give relief but is open to the objection that it leaves the ulcer which caused the trouble uncured so that the adhesions usually reform. Separation of adhesions must be done most carefully, as it may be found that they have protected a perforation which may unfortunately be opened up. Obstructions usually exist at the pylorus but may obtain in the body of the stomach, forming an hour-glass contraction.

Gastric Drainage.—The keynote to the surgery of gastric ulcer is drainage, and the best place for this is to the left of the muscular pyloric portion. There are four methods of inducing gastric drainage: (1) The Heinike-Mikulicz pyloroplasty, which does not give satisfactory ultimate results in more than 70 per cent. of the cases. It has the misfortune of leaving the enlarged opening at a high level so that if the stomach be greatly dilated, the degenerated muscle must elevate the food to the high lying outlet. There are also liable to be firm adhesions binding it to the surrounding tissues. (2) Finney's gastro-duodenostomy. This is a most excellent operation, giving a large opening in the line of drainage. It is most useful in narrow strictures and least successful in open ulcer, as the food must pass the ulcerated area to reach the outlet. (3) Rodman's operation. Excision of the ulcer, would seem to be indicated in a large number of cases; but if so it must be combined with gastro-enterostomy, (*a*) because there may be more than one ulcer, (*b*) because a stricture often follows at the site of incision, no matter how made, (*c*) because it leaves the tendency to ulcer unchecked and new ulcers may form. Rodman suggests that the most sensible thing to do is to excise the entire pyloric end of the stomach, the so-called ulcer bearing area, closing the duodenum and stomach end permanently, and then do a gastrojejunostomy in the usual manner. This would meet all the objections to the excision of the ulcer and avoid the possibility of secondary cancerous change. (4) Gastrojejunostomy. All in all this method meets the indications most perfectly, although it is probable that Rodman's operation will be often considered in the near future.

There have occurred in the surgical practice of my brother, Dr. C. H. Mayo, and myself, up to April 1, 1904, 328 operations for the improvement of gastric drainage, divided as follows: 20 pyloroplasties, no deaths but seven secondary operations. Finney gastroduodenostomy, 40 operations, one death, no secondary operations. Gastrojejunostomy, 271, mortality in the benign series six per cent., with six per cent. of secondary operations; of these five were subjected to Rodman's operation. In the malignant cases there was 23 per cent. mortality after gastrojejunostomy. Our preference for ulcer is the posterior operation made by means of the suture, reserving the anterior operation either with the Murphy button or the McGraw ligature for the cancer cases and such cases of benign disease as present unusual difficulties to the posterior operation.

Cancer of the Stomach.—Gastric carcinoma is the most frequent form of cancer met with in the human body, statistics ranging from those of Welch who gives it as 21.4 per cent. of the total and second to the uterus, to Virchow who places it first at 31 per cent., and Haberlin at 40 per cent. of the total number of cases. Why has there been so little attempt made to cure these patients by the only known means, a surgical operation? There are three reasons for this conservatism, first, a belief that cure cannot be accomplished; second, that the mortality of radical operations is almost prohibitory; third, that the diagnosis cannot be made until the case is hopeless. Let us discuss these reasons more in detail.

First.—Can cure be accomplished by operation? McDonald found 43 cases cured by operation which could not be disputed; Murphy collected 189 cases operated upon radically by Krön-

lein, Maydl, Rydygier, Czerny, Morisson, Bevan and Mayo, with 26 deaths. Of these 17 survived three years, about eight per cent. This was reduced to five per cent. by recurrence after three years; but as many of the cases were alive and well more than two years, enough of these cases would by the law of averages survive to bring the percentage up to eight per cent. or more. Not only that, but Krönlein statistics demonstrated an average prolongation of life of fourteen months over the unoperated cases. Mikulicz, in 100 resections, had an average duration of life of one and one-third years. In our own experience of 43 radical operations for malignant disease of the stomach, all but two who survived the operation, lived beyond the year; one lived three years and seven months and several are alive and well more than two years after.

Second.—Is the mortality prohibitory? Billroth had a death rate of 60 per cent. He said shortly before his death that his later years had been sorrowed by the vast number of almost hopeless cases of cancer that appeared to be attracted to his clinic, and speaking of operations for gastric cancer said, "They left the operating table in shock, from which some of them recovered." These cases went to Billroth because he was almost the only one who gave them any chance.

The mortality depends largely upon the case. In an early operation upon a patient not materially reduced, the mortality will not exceed 10 per cent., and the average mortality at this time, taking the good and bad cases as they come, is not above 20 to 25 per cent. Much of the danger depends upon the adhesions to neighboring viscera. Haberkant had a mortality of 72.7 per cent. with adhesions and 27.3 per cent. without. Mikulicz had a mortality of 70 per cent with adhesions to the pancreas and 23.5 per cent. without such adhesions. In the 189 cases by seven operators quoted by Murphy, the mortality was only about 15 per cent.

Third.—Can the diagnosis be made in time by medical means? To this I say most emphatically, No, it can be surmised, but not often diagnosticated with certainty. Exploratory incision is practically harmless and a suspicion of gastric cancer should cause us to lay the facts before the patient and his friends and let them decide whether the only means of making a diagnosis shall be undertaken or not.

There are two points in the diagnosis upon which I wish to dwell, because I believe that their significance has been exaggerated. First, as to the presence of a tumor. It has been said that a tumor of itself marks inoperability. This is not true, a small movable tumor in the region of the pylorus is a favorable indication, because while cancer of itself does not give evidence of its presence in an early stage, the tumor does by giving obstructive symptoms which call attention to the mechanical conditions present. As a matter of fact, it is only those cases located in the pyloric region which are amenable to surgical intervention. This part is accessible to palpation and also to operative procedures. Pyloric cancer, by its location, introduces mechanical features which enable an early diagnosis. I would say here that the pylorus normally is near the middle line, rather than to the right as we have been led to believe, and also that the stomach lies in a much more vertical position than has usually been pictured, so that the pylorus is not much above the lowest point of the normal stomach.

In our experience, the larger number of cases with symptoms of gastric cancer in which no trace of a tumor was present at the pylorus and without symptoms of obstruction, have proved to be hopeless cases of cancer of the body which gave no early symptoms.

The second point upon which I wish to speak is that laboratory diagnosis of cancer of the stomach has little importance during the operable period because the disease is of too slight extent to interfere with the secretions. When it does so it usually means a hopeless involvement.

Radical extirpations of gastric cancer follow modern lines. The necessity of removing the regional lymph structures is recognized just as it is in the cancer of the breast. The first great improvement was due to the researches of Mikulicz, who showed that the blood vessels and lymphatics of the lesser curvature lay in the stomach wall and that it was necessary in every case to remove all of the lesser curvature, even if the growth was small and confined to the pylorus. Cuneo demonstrated that the glands of the greater curvature were near the pylorus and that the lymph current of this region was from left to right, showing that it is not necessary to be so radical on the greater curvature, especially as the blood vessels are set at some distance from the greater curvature to allow of rapid expansion and contraction of the stomach. The lymph nodes in this situation are set free from the gastric wall with the blood vessels. As to the operation itself, by tying the four blood vessels supplying the stomach at proper points, the extirpation can be made practically bloodless, much as in abdominal hysterectomy. The duodenum beyond the growth and the stomach at a healthy point proximal to it should be doubly clamped and the diseased part cut out with the actual cautery one-fourth inch from the holding clamps, preventing inoculation of the cut surfaces with cancer. The seared stumps should be sutured with catgut at once before removing the clamps, thus checking the hemorrhage, and preventing soiling of the field from the otherwise open viscera. Lastly, both the doudenal and stomach ends are buried by silk or linen sutures and an independent gastrojejunostomy made. Such an operation in a case suitable for extirpation can be done in an hour without loss of blood or shock. We have made pylorectomy and partial gastrectomy 43 times with seven deaths.

In conclusion let me recapitulate: Cancer of the stomach can be cured without excessive mortality only when exploratory operation is under-

taken. We will not discuss the palliative operations, as they are at best but a prolongation of a hopeless existence.

OTITIS MEDIA IN CROUPOUS PNEUMONIA; WITH THE REPORT OF A CASE OF ACUTE SUPPURATIVE OTITIS MEDIA PRECEDING THE PNEUMONIA.*

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IT is well known that otitis media may be a complication or sequel to any severe systemic disease, especially the acute infections. The relationship of the otitis to the systemic condition may be as follows: (1) One who has otorrhea develops the systemic infection; (2) one who has otitis previously but has been apparently well for a long while suffers a recurrence; (3) otitis as a primary manifestation, the systemic disease following; (4) otitis as a complication or sequel to the systemic infection; (5) the otitic infection as a cause of the systemic infection or general pyemia.

To take up these headings separately in reference to pneumonia, the figures referring to the headings as enumerated above, we note:

1. One condition may have little or no influence on the other, but more frequently the otitis is made worse by the pneumonic infection.

2. When one who has had an otorrhea during childhood, although for a long time it may have remained apparently well, free from discharge or pain, a recurrence during the pneumonia is frequent. It has been experimentally shown that the pneumococcus injected in the blood is far more likely to attack any part previously damaged by injury or suppuration than one the resistance of which has not been lessened. Meltzer[1] cites several cases where the pneumonia was preceded by a severe otalgia; all had had otitis media previously in the now aching ear. In all at the outset of the pneumonia, earache was the predominant symptom, this predominance, however, never lasted longer than one day. The pain disappeared on the second or third day or it lost its intensity and finally disappeared shortly before the crisis set in or with it. In none did the earache terminate in discharge. In one of Meltzer's cases the earache, preceding the pneumonia was so striking as to so deeply impress the mother that when one year later the boy had an earache, she sent for the doctor and said the boy again had pneumonia. Her guess proved correct.

3. There may be a simultaneous infection of the ear and lung. In a few cases the ear symptoms are manifested first. This was true in my case. The ear manifestations may be so severe as to so completely overshadow the lung process, that the pneumonia is not suspected until the otalgia is relieved by incising the membrana tympani or its spontaneous rupture. My case is an example of this.

4. The otitis may be secondary to the pneumonia, and this is their most frequent relationship. During the period of expectoration, the pneumococcus brought up by coughing, enters the nasopharynx, gains access to the Eustachian tube, extends by contiguity of tissue to the middle ear, and starts a suppurative otitis media. The occurrence of this complication during the height of the pneumonia, at the time when the patient's mind is dull and perhaps stupid or delirious, pain in the ear is not complained of, and the physician's attention is directed to the lung condition he attributes the symptoms of cerebral irritation and septic infection to the severity of the pneumonia. Hence the ear inflammation is unrecognized until the drum ruptures, revealing the middle-ear suppuration, or it is discovered at the autopsy.

5. In one of Wilson's[2] cases, the otitis was revealed at the autopsy, not being previously suspected. At the post mortem, consolidation and small abscesses in the lung were found. The middle ear was filled with foul-smelling pus. The pathological changes in the tympanum showed a suppurative process that had evidently existed much longer than the pneumonia.

Frequency of otitis in pneumonia.—Otitis media complicates pneumonia more often than is recognized. This is evidenced by autopsies held on cases that have died from pneumonia and by examining the ears of a series of cases of pneumonia. In most of the statistics lobar pneumonia was not differentiated from bronchopneumonia. The following statistics taken from Meltzer's and Wilson's articles, include both types:

In Netter's 20 cases of otitis, 14 had pneumonia; in Hartman's 36 cases of otitis, 10 had pneumonia. Rasch's 43 cases of pneumonia, 42 had otitis; Teichman's 73 cases of pneumonia, 34 had otitis and Wilson's 71 cases of pneumonia, 8 per cent. had otitis. Ponfick's 11 autopsies on pneumonia cases, 10 had otitis.

In the five of Wilson's cases, whose ears were examined at the autopsy, three had suppurative otitis media, which, apparently, was the cause of the pyemia that brought about the fatal result.

In a search of the literature I failed to find a single case where there was a simultaneous infection of the ear and lungs; the ear manifestations preceding the pneumonia. I wish therefore to record the following case. The otitis for two days entirely overshadowed the pneumonia; the latter not being suspected until the ear was relieved by incising the membrana tympani.

Case.—G. M., male; physician. Never had otitis media previously. On the night of Jan. 11, 1903, he was awakened with severe pain in the left ear, which prevented further sleep; some fever. I saw him in the afternoon of Jan. 12. The only symptoms complained of was a dull aching pain in the left ear. Temperature, 102° F., pulse 90, respirations 27. The tympanic membrane was red and injected but there was no bulging or other evidence of fluid in the middle ear. Nasal examination revealed slight coryza, septum deviated to the right, and right nasal obstruction.

* Read before the Northwest Medical Society of Philadelphia, November 2, 1903.

Increased nasopharyngeal secretion. Saline purgatives, bromides to produce sleep and phenacetin for the pain and fever, were administered. Jan. 13. Rested badly during the night, slept but little, dreaming and awaking with starts; dull pain in the ear constant. During the day pain had subsided, patient resting fairly well; only a feeling of discomfort in the ear. Temperature 103.4° F. No bulging of the tympanic membrane, redness lessened, coryza unchanged, general aching throughout the whole body. Symptoms indicated influenza; this, however, proved incorrect. Jan. 14. Pain in the ear recurred in the night, increasing in intensity; chilliness and flushing alternating; general restlessness. Temperature taken by himself during the day at irregular intervals, varied from 103 to 105° F. Headache worse in the left half of the head, continued coryza. The tympanic membrane was then injected and bulging. I incised the drum and much fluid escaped. In ten minutes all pain had ceased and he felt perfectly comfortable. A small gauze dressing was applied. The discharge was so great as to wet the dressing in three hours. I was called back and applied a large dressing. When I left him at 11 P. M. the temperature had dropped to 100° F.; the patient was comfortable and thought he would sleep. At 3 A.M., however, he was awakened with pain in the right side of the chest. This increased during the remainder of the night and forenoon. Dr. A. A. Stevens was called and diagnosed croupous pneumonia. Dr. Stevens took charge of the medical treatment. The highest temperature after the paracentesis was 104.6° F. The decline was by lysis from 103.8° F. at 8 P.M. of Jan. 18, to 98 at noon of Jan. 20 and varied after that time from 97.8° to 99.2° F. until Jan. 30, when convalescence was fully established.

The discharge from the ear continued throughout the course of the pneumonia; being greatest during the height of the pneumonia and gradually lessening as the pneumonic manifestations subsided. After the lung had cleared up and the temperature remained normal, the discharge ceased and in three days the perforation in the tympanic membrane healed. I examined the ear again recently and found the drum normal in appearance, unrestricted in mobility. At times, in cold, windy weather, there is slight pain in the previously affected ear, but no more so than in others who have never had otitis media.

I regret no bacteriological examination was made. I cannot, therefore, positively assert that it was a pneumococcic otitis. But the course of the two conditions were simultaneous, the height of one corresponding to that of the other, and both subsiding together leaves no doubt in my mind that there was a simultaneous infection of the middle ear and lungs, and by the same cause. The ear symptoms developing first and overshadowing those of the lung.

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HEPATECTOMY FOR TUBERCULOMA OF THE LIVER.*

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THE operative treatment of surgical affections of the liver has been the outgrowth of the past two decades. Although abscesses and cystic growths had long been treated by surgical intervention, the surgery of solid neoplasms necessitating resection of the liver, was not undertaken until the experiments of Tillmans, Ponfick, Gluck and Cecherilli had demonstrated the compatibility of even large resections with continuance of function, and the further demonstration of the rapid degeneration of the liver tissue.

Since Lins in 1886, and Langenbuch in 1887 removed large movable portions of a corset liver, many operations have been performed upon this vascular gland. The most complete compilation of cases thus far published is that prepared for Keen by Spencer, Cushing and Downes.[1] The cases of resections numbered 76 in 1889. Cases have since been recorded by Elliott,[2] Beck,[3] Kocher,[4] Fillipini,[5] Tricomi,[6] Langer,[7] Legueu,[8] and Nauman.[9]

In gleaning the literature of this subject it becomes at once apparent that it is difficult to make a distinction for statistical purposes between cases in which the liver tissue is merely incised for the removal of an enucleable growth, and those in which a considerable portion of the liver tissue wherein the neoplasm is imbedded, is the essential feature of the operation. Keen has carefully attempted to exclude cases of hepatotomy, including in his table only cases in which resection was done. According to this table the mortality of all liver resections is 15 per cent. According to the statistics of Terrier[10] 10 out of 42 cases died from the operation, a mortality of 19.23 per cent. An analysis of the last 17 cases of Spencer and Cushing's table will show that resection for carcinoma has a mortality of 50 per cent. Of these cases recorded only three entirely recovered from the operation; one died on the third day, one after six weeks and one after three months.

Doubtless a number of cases reported as recoveries after resection for carcinoma have in reality been cases of gumma. Such, for example, was the fact in the celebrated case of Lücke, in which he removed the left lobe of the liver. Madelung[11] subsequently showed the tumor to be a syphilitic gumma. This perhaps accounts for the permanence of the cure. Elliott states that of nine cases operated on for syphilitic tumor only two died. According to this writer in 12 cases of malignant disease recently resected, eight for carcinoma and four for sarcoma, one died from the operation and two were known to have no recurrence at the end of two years. One of these is the case of Lücke to which allusion already has been made. The case of Fillipini re-

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sected for adenoma had a recurrence after three and one-half years. From personal communications from Keen, Elliott, Monks and Beck, I am enabled to report that there was a recurrence in each. Including the cases of Beck and Kocher, one death and one recovery and the one recorded below, supposed primarily to be cancerous, there are 16 cases with three deaths.

In all of these cases the growth was supposed to be primary, as it of necessity must be if at all operable, and in the form of a single tumor. That this is not always possible will be shown in the following case. If one considers the fatality of solid tumors of the liver, excluding gummata, the statistics presented, although far from promising for the permanence of the recovery, may still justify resections for solid tumors of the liver limited in number and position. On resection of the liver for solitary tuberculoma, I have been unable to find any literature. Believing that in a field of surgery where justification of operative interference and the technical methods are still somewhat debatable, every case, especially if unfavorable in its result, should be recorded. I beg to submit the following report:

Male; aged thirty-six years. First examination October 18, 1903. Admitted to hospital October 21, 1903. Both parents are living and in good health. Brothers and sisters all living. History as to lues negative. Ten years before onset of present malady had left testicle removed for tuberculosis. Since then the patient has been in excellent health until four months ago. He has been married six years and has one child, one year old and healthy. There is no history of miscarriage. In November of 1902 the patient once consulted me for a pain in the right loin which proved to be an ordinary lumbago. During the past four months he experienced a sense of weight and then of pain in the pit of the stomach. This he believed to be some form of dyspepsia. Although spare of habit, the patient has noticed some little loss in weight. He has not vomited during his illness nor has he been nauseated at any time. In the past two months he noticed a tumor growing under the tip of the sternum.

Physical examination.—Man of sallow hue of skin, but without traces of lues. Weight 120 pounds. Heart and lungs normal. Urinalysis normal. On examining the abdomen, a tumor is at once seen in the epigastric region. It can readily be palpated through the thin abdominal wall. It is irregular in outline, its long axis corresponding to the border of the left lobe of the liver. Its short axis, which is about two inches long, has its upper end removed about two inches from the tip of the sternum. The tumor seems very mobile, as it moves very distinctly with respiration. The percussion note over the left tumor is distinctly dull; and the dulness is directly continuous with that over the liver. Below and to the left, the dulness is sharply defined against the tympanitic resonance of the stomach and intestines. Examination of the abdominal viscera including the rectum reveals nothing abnormal. An examination of the stomach by Dr. Ramsey showed it normal in motility and secretion.

Diagnosis.—Tumor of the liver, probably primary in character and of cancerous nature. This diagnosis was concurred in by Professors Osler, Hare and Forchheimer.

Operation October 23, 1903. Ether narcosis. An incision in the midline from the ensiform cartilage downward and about four inches in length at once revealed the tumor which was imbedded in the left lobe of the liver. The omentum was adherent to the free border and was secured and divided between double ligatures of fine silk. This accomplished, the pylorus and most of the stomach was carefully examined and found free from disease. No lymph nodes were found in the lesser or gastro omentum. What was felt as the tumor mass was now found to be the left lobe of the liver, hardened and nodular on its lower surface, but quite movable. Since the tumor appeared malignant and therefore unsuited for enucleation, I determined to remove it by resection if I could be reasonably certain of its being a solitary growth. To this end an oblique incision three inches in length was made to the right. All of the under and most of the diaphragmatic surfaces of the liver were thereby placed within touch. A second tumor was not felt.

By gentle traction the left lobe of the liver was brought into the abdominal wound. It was difficult to hold it, so I therefore concluded to follow the method successfuly adopted by Lücke and others in completing the operation in two sittings. To this end two large, blunt-pointed bullet probes were passed at right angles through the thickness of the liver, an inch or more beneath the tumor mass, and an elastic tube thrown around the liver to form a pedicle. The lower part of the wound was closed in the usual way, the upper part lightly packed with gauze. The patient left the operating table in excellent condition; pulse 82.

October 24. During the morning the dressings became saturated with blood. When they were removed it was found that a quite profuse bleeding was going on. There was great thirst; pulse 120. Under ether anesthesia the wound was examined and the source of hemorrhage sought. It was found that the elastic tourniquet had forced the skewers through the liver tissue, thus producing slight lacerations from which the hemorrhage came. The band was therefore removed and by means of one of the skewers a very heavy ligature was made to take its place. There was no further bleeding. With the thermocautery the left lobe was now cut away without the further loss of even a drop of blood.

During the first forty-eight hours after the operation the condition of the patient promised much. There then supervened a vomiting and hiccough which could not be controlled. From the third day the vomitus consisted chiefly of blood. There was neither pain nor abdominal distention indicative of peritoneal infection.

Death followed on the sixth day after operation, probably from necrosis of the gastric mucosa from retrograde thrombosis of the omental veins. A partial autopsy was made. Dr. Carl Hiller reports on this and on the nature of the tumor as follows: The excised piece of liver is cone shaped with the apex representing the extremity of the left lobe, and the base artificially produced by the incision with the thermocautery. This base measures 32 cm. in circumference, 9½ cm. in its longest and 8 cm. in its shortest diameter. The surface is smooth and unaltered except at one portion which when the liver was undisturbed in the abdomen was on the under surface close to the anterior sharp margin. Here there is a nodule of grayish-white color standing out in bold relief against the surrounding liver tissue, which is of a normal color and consistence. The nodule when a cut is made into it at right angles to the surface of the liver, presents an ovoid surface of firm consistence throughout and is sharply defined from the adjacent liver substance. This nodule measures on its cut surface 23 mm. in its shortest and 26 mm. in its longest diameter.

On examination after death the remaining portion of the liver showed that where the elastic band had compressed it, there was much discoloration. Other than the presence of a similar nodule half the size of the one already described, nothing abnormal could be detected. This nodule was in the right lobe on the upper surface of the liver close to the peritoneal reflection. With the exception of a slight inflammation about the stump of the liver, nothing abnormal could be detected in the abdomen.

An examination of the specimens made from the nodule by the microscope reveals connective tissue in large amount. Both fully developed and forming connective tissues are found. The youngest connective tissue is represented by loosely packed spindle cells which lie by the side of cells with large vesicular nuclei. These are believed to be epithelioid cells derived from connective cells. Here and there, but not very frequently, can be noticed a giant cell with peripherally situated nuclei and a degenerated center. Blood vessels exist only as capillaries which are limited to the outer portions of the nodule. It is here that the nodule is most cellular, so that the appearance of granulation tissue is presented. Separating the granulation tissue from the most central portion of the nodule are more matured connective fibers, which at places are quite dense. The center of the nodule is made up of a homogeneous necrobiotic area of large extent, which contains here and there a few cellular elements.

The diagnosis of solitary tubercle was made, although the tubercle bacillus could not be demonstrated in the specially stained sections.

Remarks.—In connection with the case reported, I would direct attention to two questions, one involving that of diagnosis, the other that of the technic necessary to forestall hemorrhage.

The diagnosis before operation was that of primary hepatic tumor. This was made with the full knowledge of the great rarity of such tumors. Kehr in 600 laparotomies found only one of this nature. Of cancer not more than one in 64 is primary. Man[12] found 246 secondary and only four primary cancers. The most extensive manual and visual examination of the liver possible at the time of operation failed to reveal a second growth. Nevertheless the autopsy showed such a lesion in the right lobe of the liver, where it could not be felt intra-vitam. The very serious difficulties hampering the pathologist in coming to a conclusion as to the nature of the growth when diligent study of sections is made will show the difficulty of the operator in determining the nature of a solid growth, while the operation is in progress. At the time of the operation it was believed that the tumor herewith presented was a primary carcinoma. A more careful examination makes it almost certain that the case is one of large tuberculoma. Solitary tuberculous tumors of the liver, although described by pathologists, are exceedingly rare. I believe this to be the first case in which a resection of the liver was made for a tuberculous tumor.

In regard to the technic of hepatectomy, it may now be laid down as a rule that immediate closure of the abdominal wound is to be condemned. In the cases of Langenbuch and Wagner severe secondary hemorrhage followed this procedure. Langenbuch had the temerity to reopen the abdomen. Even when the intraperitoneal method of treating the wound is practised, a gauze tampon as used by many surgeons including Eiselsberg, Israel and Keen, ensures the safety of the peritoneum against contamination from bile and against concealed bleeding.

The extraperitoneal method adopted by me in the case reported has been followed according to Tricomi in about 37 per cent. of all hepatectomies. Of course, it is applicable only to cases where a pedicle can be formed. Following the method of Lücke, an elastic ligature was used and this was held in place by skewers. It did not prevent bleeding because of the cutting of the rubber constricting band. It does not seem to me, however, that the exitus in this case can justly be ascribed to the hemorrhage. As to the safest means of preventing this when the intraperitoneal method is to be followed, operators are still at great variance. The thermocautery has very many advocates but is considered unsafe by Kocher. Clean excision and careful ligation of the large veins with catgut. as done by Heidenhain, Keen and others, permit the reduction of the liver wound by approximating its peritoneal margins. The experiments of Kusmetzon and Penzky have shown that the tying of hepatic veins of transfixion sutures is, at least in animals, an easy method of arresting hemorrhage. This method, together with gauze packing for added safety, seems to me an ideal one where applicable. In two cases Kocher used pylorectomy clamps on each side of the mass to be removed, crushing through the liver tissue. The mass included between the forceps was removed with a knife with-

out much bleeding. The forceps were left in position forty-eight hours. In one of his cases, however, a fatal prolapse of the intestine occurred through the wound.

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THE RELATIONSHIP EXISTING BETWEEN OPHTHALMOLOGY AND OTOLOGY AND DENTISTRY.*

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WHEN requested to write something for this society upon the relations of odontology to ophthalmology and otology, I assumed that the invitation, was not so much an honor to me as the manifestation of a strong desire on the part of this society to be again addressed by some one possessing the name of Allport. Many gentlemen in the room this evening were my father's personal friends; some are here who did not know him. But whether knowing him as an associate and colleague or belonging to a newer generation which did not know him at all, whether trusting him and agreeing with him in his strong and undisguised views concerning dentistry and its destiny, or disagreeing with him and considering him overzealous or too enthusiastic, I am confident you must all unite with me in regarding him as one of the world's great dentists, and as a man whose honesty, integrity and purity of purpose can never be brought into question. I am sure it would gratify my father immensely if he could know that a dental society had invited his son (a physician) to address it upon the interdependence existing between Medicine and Dentistry. For those of you who knew my father, or have followed his life, know that he lived principally for one object, viz, to see dentistry acknowledged throughout the length and breadth of the civilized world as a legitimate specialty in medicine, even as ophthalmology or neurology is so considered.

To this end and in order to make the idea symmetrical, he believed that dental schools should have no existence except as post-graduate institutions, that those desiring to become dentists should first take a degree as a doctor of medicine, and should then pass into a dental school to receive special instruction in his chosen profession. He advocated and secured the establishment of dental chairs in medical colleges; he was largely instrumental in the establishment of a dental section in the American Medical Association, and in the International Medical Congress. Besides these important labors, he was a practical dentist who had few equals and, I believe, no superiors. He was a friend of good and conscientious work wherever found, and was always a kindly and honest advisor to young, struggling and ambitious colleagues; he established fees for dental services that have been a lasting benefit to dentists in Chicago and elsewhere; and I think you will all unite with me in saying that the benefits which he conferred upon dentistry are far-reaching and will never die.

I trust you will pardon this eulogy of my respected father, which some may regard as in poor taste, but the pleasant conference between this society and myself seemed a not inappropriate occasion for me to speak the thoughts which lay uppermost upon my mind concerning his life and work, and to pay a tribute to his memory, which I trust, nay believe, has not fallen upon unsympathetic ears.

It surely requires no strength of the imagination to assume a distinct connection between ophthalmology, otology and odontology. No portion of the body is a kingdom in itself, independent of other portions. Cardiac affections may permeate every nook and cranny of the human organism, and the same may be said of hepatic, spinal, uterine and other diseases which have their principal pathological centers in some particular section of the body. No argument is necessary to convince us that diseases of the teeth and mouth may produce pathological changes in the organs of sight and hearing, and possibly *vice versa*. We know it because we have seen it over and over again, and an article on this subject is only valuable as an effort to emphasize and reiterate well-known facts and to crystallize them into definite and tangible form, for, although these clinical data stand undisputed, it is much to be regretted that ophthalmologists and otologists are prone to neglect carelessly the prolific etiological influence of the mouth.

Diseases of the mouth may produce pathological changes in the eye or ear by one of two channels, by direct continuity of tissue, or by reflex irritation. We must not, however, lose sight of the fact that many diseases whose underlying cause has been ascribed to an elusive reflex phenomenon, have been shown to originate in an actual migration of infective microorganisms along the fibers of nerve tissue. Neither should we allow the pendulum to swing too far the other way in this age of doubt and materialism, to the elimination of *all* reflex pathological conditions, for it is surely difficult to harmonize the theory of septic infection with prompt disappearance of subjective and objective phenomena, upon the removal of the offending cause, such as a tooth, for instance. As illustrating the point, Milliken reports a case of healthy man who contracted two attacks of iritis: The first came on with the cutting of a wisdom tooth and disappeared upon the subsidence of the gum inflammation; the second after losing a filling in the third molar

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upon the same side as the affected eye, and was immediately relieved after the tooth was excavated, sterilized and filled. There was no apparent septic invasion of the iris, and the prompt disappearance of inflammation upon the removal of the irritating cause would seem to argue against the theory of septic migration.

As a still clearer instance of the actuality of reflex influence, Neuschüler, of Turin, reported a case in the *Recueil d'Ophthalmologie* for August, 1899, of a man who noticed that after prolonged use of the eyes he suffered from an intense pain in the orbit which, later would invariably spread to the teeth and become so severe as to necessitate cessation of eye work; a correction of his refractive error by glasses relieved all his symptoms. In the *Annals of Ophthalmology and Otology* for October, 1895, Foucher, of Montreal, reports the case of a man fifty years of age, who had a decayed, aching and broken molar tooth. He developed a keratoscleritis and conjunctivitis, together with herpetic eruptions on the cornea, and a little above the eyebrow along the sensitive branches of the ascending frontal nerve. The tooth was extracted and permanent relief promptly obtained.' Foucher also reports another case of a woman age twenty-one years, who had an irritable wisdom tooth, accompained by great pain in the eye and optic neuritis, with total suppression of vision. The tooth was extracted and a speedy cure followed. Samuel Theobald, of Baltimore, reports a case in the *Medical Record* of Feb. 25, 1883, of a man, aged twenty-six years, who contracted a suppurative inflammation about the root of the left upper lateral incisor tooth, the pulp of which had been previously destroyed by a dentist. The tooth was decayed but not painful. The pupil of the left eye became dilated and paralysis of accommodation occurred. The tooth was extracted and the ocular affection was soon cured.

Theobald in the same issue reports a very remarkable history of a man thirty-five years of age, the crown of whose right upper lateral incisor being broken off, inflammation around the root and alveolar process followed. Both pupils speedily became immobile and paralysis of accommodation took place together with retraction of the lids of the right eye. His taste was impaired. The tooth was extracted and the morbid conditions were less severe, but a cure was delayed from time to time by root and alveolar inflammation of other teeth. Each time a tooth was extracted the ocular conditions improved but fresh exacerbations occurred as the inflammation was continued from one tooth to the other. A cure was not accomplished until all the diseased teeth had been extracted.

It certainly appears as if in this last case of Theobald's we may at least feel we have had a striking example of reflex ocular disease due to persistent irritation of a branch of the fifth nerve. The theory of cell migration seems hardly possible with a history of such frequently recurring ocular explosions, accompanied by complete cure upon a removal of the etiological factor. Sewell claims to have seen the development of a cataract after extracting a tooth, although one case of this nature hardly seems sufficient basis for an opinion. Neuschüler in the *Jahrbuch für Augenheilkunde* 1888, p. 403, reports a case of incorrect balance of the ocular muscles which appeared to act as an etiological factor of toothache, as the latter was cured by a correction of the muscular anomaly by the use of prisms. Knies claims to have occasionally cured nictitition by the removal of a painful tooth, and Gasselin makes similar assertions concerning supraorbital neuralgia. Amblyopia and amaurosis are quite frequently reported as caused by irritable teeth by Lardier, Gill, Metras, Samelsohn, Keyser and others, and Knies observes that when the symptoms appear without any other visible lesion, the connection may be taken for granted. The majority of dental reflex disturbances of an ocular nature, however, seem to be those of diminished or suspended accommodation, and Schmidt in the *Archives of Ophthalmology*, Vol. XIX, p. 107, has noticed 73 cases of weakened accommodation out of 92 recorded cases of ocular disturbance with dental etiology, and claims that such reflex phenomena are especially frequent in young people. It is indeed a matter of common observation that many of the eye and ear diseases of infancy and childhood, notably phlyctenular keratitis and conjunctivitis and acute otitis, are apparently caused by teething and defective teeth, frequently accentuated by the entire absence of parental supervision over the mouth and first teeth of growing children.

Who shall gainsay the theory that one reason why children are so prone to eye and ear affections is, not only the occurrence of exanthematous and children's diseases, but also the presence of the physiological and pathological condition to which reference has just been made? It might indeed be difficult to prove that the discouraging and prolonged interstitial keratitis so often accompany the pegged, softened, serrated and sensitive teeth of Hutchinson, are dependent entirely upon the underlying syphilitic taint. I think it is not at all impossible that an etiological factor might also be found in the characteristically diseased teeth, almost if not quite invariably present in these cases, and one reason why interstitial keratitis of this nature is so stubborn and prolonged in its clinical history may be found in the equally and coincidentally stubborn and prolonged morbid condition of the teeth. Schmidt is of the opinion that many morbid ocular conditions of dental origin are dependent upon a nervous relaxation of the ocular blood-vessel walls, thus allowing an abnormal amount of blood to remain in the eye and producing various paretic and other conditions, such as sluggish pupils, loss and spasm of accommodation, congestion of the retina, uveal tract and optic nerve, or even glaucoma, etc. Kneiss thinks that when loss of accommodation occurs during a toothache it probably results simply from the lack of vigorous innervation due

to intense suffering. He also thinks that muscular insufficiency and diplopia, which are occasionally observed, may also be explained as paresis due to enfeebled innervation, a theory which can be readily understood as an easy and rational explanation of some at least of the clinical phenomena.

We have all seen a severe toothache produce neuralgia, redness of the eye and excessive weeping, but we must not be too quick to conclude that the tooth is an etiological factor, not indeed, until the neuralgia and ocular conditions promptly disappear upon cure of the dental disease. The outlines of cause and effect, however, are sometimes beautifully demonstrated, as for example in an instance cited in 1885, by Hutchinson who observed a marked case of lagophthalmos from spasm of the levator palpebræ superioris, which promptly ceased upon the removal of an aching tooth, and Vossius in the *Archives für Ophthalmologie,* Vol. 33, mentions cases of exophthalmos developing from serious infiltration of the orbital tissue, which disappeared rapidly after extracting a diseased tooth. Instances of this nature have also been observed by Burnett in 1885 and Pagenstetcher in 1884, and Dimmer in the *Wiener medicinische Wochenschrift* for 1883, p. 299, claims to have seen metastatic choroiditis produced by the reflex irritation of extracting a tooth. Again referring to Kneiss, he notes that pain in the upper teeth on the same side as the affected eye is a frequent symptom of the so-called ciliary pains of keratitis, but particularly of iritis and cyclitis. Less frequently there is pain in the teeth of the lower jaw on the same side, and still less frequently in those of the other side; these are cases of irradiation of pain to adjacent nerve twigs.

Neuralgic toothache may be the prodromal sign of glaucoma. It must not be forgotten that the same general nervous supply extends both to the teeth and the eye, not only through the medium of the fifth pair of nerves, but also through the sympathetic system, and it is not difficult therefore to see how amblyopia, amaurosis, iritis, keratitis, conjunctivitis, strabismus, cycloplegia, etc., may be produced by diseased teeth of the upper, and even of the lower jaw, and also by poorly and improperly adjusted sets of artificial dentures, and malposition of the wisdom teeth.

While diseases of the ear of reflex origin dependent upon mouth diseases are not so well cut and clearly defined and recognized as ocular abnormalities, still they constitute a potential factor in aural histories, and must never be eliminated by one who makes careful examinations of his cases, for it is possible from time to time to find in the mouth the neglected and possibly unsuspected cause of some aural disease. I have used the word "unsuspected" but would not have it interpreted in its broadest sense, as I am personally exceedingly sceptical of the probable existence of an absolutely quiescent etiological condition. I regard it as very improbable that a diseased mouth will cause reflex or eye disturbances without the existence of some palpable morbid oral condition manifested both subjectively to the patient and objectively to the physician. This to my mind is the cheerful side of the otherwise mysterious and unfathomable history of reflex power. Without this probability the position of the careful diagnostician must oftentimes be wellnigh without hope, and attended by a helpless groping about in the Egyptian darkness of hidden and unknowable reflex pathology. In other words, if a diseased tooth is producing reflex eye or ear disturbances, I believe it will ache, sometimes more, sometimes less, sometimes being practically quiescent, but ache, and that a careful examination of the patient will disclose this fact, and clearly demonstrate its position as a source of disease. Therefore when I use the word "unsuspected," I mean "unsuspected" by the patient, for even though he has had a toothache or an otherwise known mouth disease, he does not associate it with his eye or ear disease because, like Kipling's "Vampire," he "does not understand," or "unsuspected" by the physician, because he is careless in his examination and diagnosis, or indisposed to attach much importance to oral diseases. The same pathological conditions of the mouth which will produce reflex eye diseases, and to which reference has already been made, will also cause reflex aural affections, and reversely, ear diseases may produce intolerable toothache. The terminal distribution in and about the mouth of the sensory and motor branches of the sensitive trigeminous and its associates with the great sympathetic, connects the teeth with the entire aural organism, and explains many of the reflex disturbances developing from the oral cavity.

The range of ear diseases produced in this way is much more limited than is the case with eye diseases, owing probably to the fact that there are fewer affections of the ear than of the eye, and also because the eye is more sensitive and susceptible to nervous conditions than the ear. Such aural affections are principally myringitis, earaches, sensitiveness of the ear canal, hyperæsthesia of hearing, deafness, furuncles and eczema of the ear canals, especially in children of a tuberculous or strumous diathesis, etc. The frequent occurrence of such aural affections, especially otalgia, with the teething of children, and its almost immediate relief by lancing of the gums, is of such common observation as to excite no comment. In lancing the gums under such circumstances, the incision should be deep so that the tooth may be absolutely liberated, for the pressure between the gum and the tooth crown is not the essential etiological factor, but the pressure at the root ends on the branches of the fifth cranial nerve, when the trouble is in the upper jaw, or on the inferior branch when in the lower jaw.

I have no doubt that careful examination of patients, both young and old, with such etiological factors in mind, would disclose the cause of many aural affections. Baldwin, in the *Journal of the American Medical Association* for Jan. 31,

1903, records seven cases of earache with no evident cause but exposed tooth pulp, all of which yielded promptly to treatment of the teeth, two cases of severe earache during the regulation of cuspid teeth due to tension of the regulating apparatus; many cases of pain in the ear during the filling of teeth, especially molars; one case of earache due to sensitive dentine; twelve cases due to deciduous teeth blocking advancing molars; eleven cases of tinnitus aurium, much if not entirely relieved by treatment of the teeth. As can be readily imagined, it is sometimes extremely difficult to draw the line between eye and ear diseases which are reflex in their nature, and those which are produced by actual cell migration or by inflammation spreading by direct continuity of tissue. Some conditions may be easily classified while others must needs live so near to the borderland that their nativity is shrouded in pathological mystery. It must not be forgotten that the periostal lining of the orbit is continuous with the alveolar border of the upper jaw, and almost so with that of the lower jaw as well. The mucous membrane of the mouth is directly continuous with that of the conjunctiva, Eustachian tube and middle ear. Occasionally the apices of the roots of some of the upper teeth extend directly into the antrum of Highmore, and from this situation disease frequently reaches the orbit through a thin partition of bone. The angular artery and certain veins run almost directly from one region to the other.

Personally, I am exceedingly skeptical of those cases of so-called reflex ocular or aural disease of oral origin, where intense inflammatory or purulent conditions are present in the eye or ear. I believe such diseases to be produced either by the migration of infectious microorganisms, through the nervous or vascular structures, or else by the extension of inflammation by periosteal or mucous tissue. Arnold Knapp reports a case in the *Archives of Ophthalmology* for May, 1902, of a patient, sixteen years of age, whose right canine and two upper incisor teeth had been filled at the line of the gums. Alveolar abscess followed in three days, the right side of the face became swollen and the right eye closed. Five days later the gum in front of the canine tooth opened and pus was discharged. The swelling diminished and the lids opened. The right eye was blind, the optic nerve white, the pupil was dilated and immovable. A firm flat swelling appeared in the orbit. A purulent fistula was established in the canine fossa. A probe could be passed upward and forward under the periosteum and exposed a roughened bone detached. The eye remained blind. F. W. Marlow, of Syracuse, N. Y., reports a case in the *Annals of Ophthalmology* for Jan., 1897, of a young woman, aged twenty-five years, who had an alveolar abscess of the first bicuspid of the left upper jaw which was opened and cured. It proceeded from an infected root canal. She developed pain in the ear and optic neuritis with great blurring of vision and subsequently entirely recovered. Dagilaiski, of Novgorod, reports a case in the *Klinisches Monatsblatt für Augenheilkunde* for July, 1899, of a boy seven years of age who suffered severely from alveolar abscess in the upper jaw accompanied with much swelling of the cheek and face, particularly about the eye. Pus was pressed from the diseased and carious tooth socket, which was that of the first upper left molar. The tooth was extracted and the antrum cleaned, during which process much pus escaped from the nose. A cure followed and Dagilaiski believes that the infection spread from the tooth along the periosteum of the upper jaw. Braunschweig has observed two cases of iritis with pus in the anterior chamber as a result of diseased teeth, and Swanzy has seen cases of orbital cellulitis following inflammatory conditions in and around the teeth. It is a matter of common observation that erupting misplaced and diseased wisdom teeth often cause tonsilitis, which is followed by inflammatory and painful ear affections of a purulent or non-purulent character, probably produced by the close connection between the tonsillar region and the Eustachian tube.

But it is unnecessary to further rehearse cases and illustrations; the facts are well known to us all, and I presume there is not a practitioner present who could not substantiate all I have said, with citations from his private practice. The purpose of this paper is not to furnish new thoughts, but to emphasize old ones, for a long personal experience in ophthalmology and otology, with an inherited tendency to exaggerate the importance of odontology, leads me to the belief that proper respect is not yielded to the undoubted connection between your specialty and mine. I would particularly urge eye and ear surgeons to carefully examine the mouth as a matter of routine, not forgetting to closely scrutinize crown work and plates, remembering that crowns are often injudiciously placed, that artificial teeth sometimes do not fit, and are even occasionally fitted over broken roots, which can hardly fail to produce irritation, reflex and otherwise, that may account for physical ailments unsuspected by an inexact diagnostician.

Following the advice of Baldwin, I would urge the establishment in all free dispensaries of a dental department, where proper oral therapeutics might be administered and where cases of the nature outlined in this article, could be promptly referred and correctly treated, and it is gratifying to note that at a recent meeting of the National Dental Association, held at Asheville, N. C., the following resolution was unanimously adopted:

Resolved: That it is the sense of the National Dental Association, that each medical college in the United States should include in its curriculum a lectureship on oral hygiene, prophylaxis, and dental pathology.

This resolution should be warmly endorsed by the medical profession and especially by those who are influential in framing the policies of medical instruction, for the active influence of oral physiology or pathology upon bodily health

and disease can no longer be brought into question.

It is also gratifying to know that the municipality of Strasburg has recently voted to build an $80,000 dental hospital for school children. Every pupil in the schools is to be submitted to a dental examination on entering and twice during school time until the age of thirteen. The municipality has come to the conclusion that a large proportion of the ills of young people are due to bad teeth and lack of proper dental attendance. Now, while it may not be possible to erect hospitals for this laudable purpose in all cities, it is both possible and feasible for boards of education and boards of health to appoint dentists who may quickly, yet efficiently, examine the teeth and mouths of all public school children once a year. Those suffering from oral abnormalities can receive warning cards to be given to their parents, notifying them of such conditions and advising them to have their children's mouths cared for either at some office or free dispensary. In this way the health of the coming generation would be much improved and a truly incalculable benefit conferred upon mankind. Years ago I devised a plan of this nature for the examination of school children's eyes and ears by school teachers, which has proven most successful and is now being used with gratifying results all over the United States, and even in many cities in Europe and Asia. If the plan is successful in searching for eye and ear defects, why may it not be equally efficient in detecting those of an oral character? I believe it may, and that it only needs the combined action of a united profession to place it in operation.

A HISTORICAL SKETCH OF SOME OF THE SO-CALLED CURES FOR CONSUMPTION: WITH A FEW NOTES ON LATER-DAY TREATMENT.

BY J. EDWARD STUBBERT, M.D.,
OF NEW YORK.

(Continued from Page 693.)

Maragliano* reports 130 patients treated with antitoxin serum, which is obtained in a manner similar to that of antitubercle serum. Of these "36 were clinically cured, including 17 with fever and destructive processes, with a cavity in three; 58 were improved, and the disease remained stationary in 31. In the remaining five the disease progressed. None of the advanced cases treated in the Institute were cured."†

In studying the results given by this form of treatment, the question arises whether there is any specific action in the specially prepared serum, or whether the ordinary serum obtained from any healthy animal, such as the horse or goat, would not produce an equally good effect. When we consider the pathology of the tuberculous deposit, remembering that, in the interior of the tubercles, the circulatory and lymph channels are excluded, it must be concluded that sera and tuberculins can have no direct effect upon the bacillus, but that the result must be obtained by an improved nutrition and increased resistance of the tissues surrounding the diseased area. Tuberculin and its modifications, as well as antitubercle serum, are still used by a small number of observers, and good results are from time to time reported. Among the modifications of the tuberculin of Koch and similar preparations, we need but mention: Kleb's tuberculocidin and antiphthisin, tuberculinum purifactum, water extrace of tubercle bacilli (Von Ruck), Maragliano serum, antiphthisic serum T. R., tuberculol, oxytuberculin, and U. S. antitubercle serum.

It is generally admitted that all these preparations are of use only in the early and incipient stages before any pyogenic bacteria have added the complication of septic poisoning, a time when it is also possible to check the disease with many other means at our disposal. A study of the reported results is interesting as indicating the class of cases in which tuberculin is of greatest service. Langenbeck and Wolff, Goetsch, Krause, Heron, Denison, Trudeau, and Von Ruck have reported their percentage of cures. They vary from 32 per cent of apparently cured cases, treated in various stages of the disease, to 83 per cent of those treated in the incipient stage only. Trudeau, with 24 cases, and Goetsch, with 175 cases, treated in the incipient stage only, report as apparently cured 83.0 per cent. and 71.0 per cent. respectively. In contrast, the percentages of those who did not limit the use of tuberculin to the incipient stage, average 38.6 per cent. Results in all the cases reported by the above writers show that of 416 patients treated, the average percentage of apparently cured cases is 51.73 per cent. Others who have used tuberculin, either as a therapeutical or diagnostic agent, are Koch, Douglas, Powell, Osler, Fraenkel, McCall Anderson, Eric France, C. T. Williams, Pottenger and Cornick. "Opinions differ greatly as to its value in treatment, less so as to its diagnostic use."*

A most dreaded condition in pulmonary tuberculosis is the occurrence of mixed infection causing a septic poisoning, as indicated by a high, spiked temperature curve, profuse sweating, rapid emaciation and depression of the patient, gastric disturbance and an excessive expectoration of sputum, muco-purulent or purulent in character, containing besides tubercle bacilli large numbers of streptococci, staphylococci, and sometimes diplococci. When the streptococcus predominates, a most satisfactory result is generally obtained from the use of antistreptococcic serum, 10 c.c. repeated every second or third day for two or three injections, if necessary. Often a single injection or 10 c.c. of the serum suffices. A drop in the temperature is immediately noted, sweats cease, there is less cough and expectoration, the nutrition improves, and the patient gradually

* Journal American Medical Association, Sept. 7, 1901.
† Progressive Medicine, Sept., 1902.

* Progressive Medicine, Sept., 1902.

loses the hectic flush. Examination of the sputum shows the streptococci to have disappeared entirely or greatly diminished in number. Throughout the course of treatment, the injection of antistreptococcic serum should be repeated as often as those germs reappear in the sputum. Their presence may be presaged by a return of temperature, sweating, and loss of appetite, leading to a bacteriological examination, which should be made at regular intervals in order that the reappearance of the pyogenic coccus may be met at once by full doses of the antistreptococcic serum.

Recognizing the staphylococcus as being frequently associated with the streptococcus in the mixed infections of tuberculosis, efforts have been made to obtain an efficient antistaphylococcic serum. Last year in France a combination product of both cocci was manufactured and a sample sent to this country. That sent to the writer was damaged in transit, so no accurate data were obtained. The reports from its use in France, however, are not as encouraging as we hoped, but the same investigators are still experimenting along this line.

Under the head of electricity we may consider not only the direct effects of the static and faradic forms, but also the active and powerful rays emanating from an electrical source. In static electricity, administered to a patient on an insulated platform, we possess a valuable adjuvant. In weakened and debilitated persons, as well as those of more robust temperament, its administration as a tonic should not be neglected. Giving the patient the positive electrode, the tonic effect is obtained. Cellular activity is increased, the gastric function is improved, and the absorption of both nourishment and drugs promoted. The latter effect is conspicuous in anemic persons, in whom the administration of iron together with the application of static electricity gives quicker and more decided results than when the electricity is not used. This fact was made clear to me by subjecting persons, who had previously been taking iron without the desired effect, to the static current and breeze, and noting a rapid improvement in the anemic condition and general health. In patients of neurotic tendencies the sedative effect of the negative pole is desired, which is soothing and productive of peaceful slumber.

The rays from an arc light, when concentrated upon the chest by means of powerful lenses, are supposed to possess a penetrative power intense enough to react on deep-seated tubercle bacilli, attenuating or even destroying them and, at the same time, restoring the tissue about the tuberculous focus to a more healthful condition. If it can be determined beyond a doubt that light in its various forms is so efficacious, we will have, theoretically, the ideal treatment for tuberculosis. Inhalations, injections, both intravenously and subcutaneously, and the administration of certain drugs are no doubt useful, but they do not penetrate tuberculous deposits because of their non-vascularity. Now, if a penetrating light is a germicide, might we not rationally expect a destruction of bacilli *in situ?* This accomplished, the disease should be limited to such an extent that general treatment, along the lines indicated at the present day, should permanently arrest the tuberculous condition. However, some observers believe that "X-ray stimulation does not kill tubercle bacilli, but stimulates them to excessive overgrowth and only affects them adversely by attenuation from overgrowth."*

As evidence of the germicidal action of the light rays, the writer recalls a case of empyema in which there was reaction of eight ribs resulting in a permanent fistula. The patient wore a silver tube fitted with a valve to prevent ingress of air after compression had arrested the activity of the tuberculous process in the lung. The discharge from the fistula contained tubercle bacilli and pus cells. He was exposed daily, for fifteen minutes, to the direct rays of an arc light with the result that, at the end of two months, the bacilli had disappeared from the discharge. This treatment was continued for six months, during which time no bacilli were found either in the sputum or the discharge, but two months thereafter microscopic examination revealed a few bacilli in the discharge.

Exposure of the bared chest to sunlight has been practised, but it has been demonstrated that the arc light, placed eight to ten inches from the chest wall, has slightly more power than the sunlight when it reaches the earth on the hottest summer day. The light is intensified by placing behind it a powerful reflector.

Currents of high frequency have been experimented with by Margazalli, Maragliano† and Chisholm Williams.‡ They agree that good results are obtained in that there is an improvement of all symptoms, and that bacilli are decreased in number after an initial large increase. The effects of high frequency current are: (1) Increase of pulse-rate during the actual applications of the currents, especially in consumptives; (2) increase of respirations which, after a time, become deeper in character; (3) increase of the power of digestion; (4) on the tubercle bacilli, attenuating their virulence by stimulating them to excessive overgrowth; (5) increased action of the kidneys. In his experiments on animals and men, D'Arsonval observed that the output of CO_2 was raised from 17 liters to 37 per hour, and the production of heat was increased from 79 calories to 127 per hour.

Recent investigations by G. Kaiser (*Wiener klin. Wochensch.*, 1902, No. 7) have caused him to ascribe to the action of the blue light a remarkable power of penetration, together with a depressing influence on bacilli.

The Finsen light, obtained from an arc light with the use of reflectors and lenses, has been exploited as a cure for malignant diseases, super-

* Forbes and Wolfenden, Arch. Roentgen Rays, Aug., 1900.
† Journal American Medical Association, August, 1901.
‡ Philadelphia Medical Journal, November, 1901.

ficially situated, as well as lupus and pulmonary diseases. The original apparatus of Finsen has been modified in London. The results attained by its use do not seem to exceed or even equal those produced by the X-ray, nor does the Finsen light seem to be as powerful. It takes about twelve months to cure a case of lupus, while with the X-rays a similar result may be obtained in from six to twelve weeks. This may be due to the fact that the rays of shortest wave length, coming from the violet end of the spectrum, produce a chemic action. These rays are obtained more freely and in greater quantity from the X-ray tube than from an arc light, and, therefore, in the X-rays we possess a far more potent therapeutical light than the Finsen rays. Whatever the action of the X-rays may be on tubercle bacilli, it has given decided clinical results in some cases. In one case, treated by the writer, decided improvement was obtained. The patient was a male, forty years of age, with extensive areas of tuberculous consolidation and softening in the upper portion of both lungs. A large cavity was present on the left side and below, extending to the lower border of the upper lobe, was an area in which softening was rapidly progressing. On the right side there was a similar condition existent in both the upper and middle lobes, except that the cavity was smaller. A fatal prognosis had been given, and the patient told to go home and give up treatment. At his own request (he being a physician), the X-ray was applied four months, with the following results:

The evening temperature fell from 103° to 100° F., expectoration decreased about 60 per cent., the number of pus cocci were markedly decreased, and the sputum became more mucoid in character. No beneficial effects were observed upon the tubercle bacilli; on the contrary they seemed more prominent in the microscopic field, thus bearing out the statement heretofore made that the first effect of the X-ray upon tubercle bacilli is to promote overgrowth. The patient's weight increased one or two pounds and then remained stationary. The cavity on the left side became somewhat smaller and the area of softening below it was replaced by comparatively dense fibroid tissue. The small cavity on the right was partially obliterated, and a portion of the softened area disappeared entirely while that remaining was replaced by fibroid tissue. An interesting clinical feature in this case was that, proportionately with the increase of fibrosis, dyspnea increased. The patient was finally sent to Arizona to spend the winter months, and the partial arrestment of the disease has continued. This case is quoted only as a matter of interest, with the statement that one case does not make history.

The action of the X-rays on the skin is noted in three degrees: (1) Tanning, (2) blistering, and (3) burning. The first is unavoidable and harmless; the second occurs very frequently and, by some authorities, is considered necessary to attain the best results; and the third is sometimes unavoidable, but never dangerous. The latter, however, should be avoided whenever possible, both in the interest of the patient and the physician. The writer believes that the action of the X-rays encourages a breaking down and absorption of the tuberculous deposits at the same time that an increased activity of the healthy tissue surrounding the diseased area causes a protective fibrosis. Overstimulation with the X-ray may produce an undesirable extensive breaking down, which produces a septic condition, indicated by a rise in temperature, and, if persisted in, may hasten the death of the patient. Therefore, it must be remembered that, even without burning, it is possible to do the patient great harm. The temperature should be watched in all cases under X-ray treatment, as well as the condition of the skin. The absorption of ptomains from small areas of diseased tissue, when broken down by the X-rays, is of no importance, but when the areas thus acted upon are at all extensive, the patient may readily be overwhelmed by sepsis and too rapid absorption.

Upper Air Passages.—It will be well to note here the importance of a thorough examination of the upper air passages in all cases of pulmonary tuberculosis. As an aid to treatment, it is absolutely necessary to remove all obstructions to proper respiratory movement from the nasal passages, naso-pharynx, pharynx and larynx. Turbinal hypertrophies, septal spurs, polypi, adenoids, enlarged faucial and lingual tonsils should be removed. Chronic congestion or infiltration of the arytenoids, if discovered early, may be easily cured by prompt local treatment. Statistics show that not less than 25 per cent. of persons suffering from pulmonary tuberculosis have more or less involvement of the larynx and nasopharynx. Of this number 38 per cent. present congestion or infiltration of the arytenoid cartilages, interarytenoid space, ventricular bands or vocal cords; 32 per cent. show ulceration in one or more of these places, most frequently on the cords or interarytenoid space; 30 per cent. have some abnormal conditions of the nasopharynx. I wish to emphasize this point because frequently in the consulting room, it has come under my personal notice that physicians of high standing have permitted such conditions to escape their observation.

Intravenous Injections.—In the hope of more surely reaching the affected areas in the lung, the intravenous injection of antiseptics has been proposed. Subcutaneous injections have also been made. The drugs thus used are formic aldehyde, hetol, cinnamate of soda, and cacodylate of soda. Landener's treatment of intravenous injections of sodium cinnamate has been employed by other experimenters, with a wide diversity of opinion as to the results. Albert Mann* believes a leucocytosis is set up, which, together with an active aseptic inflammation about the diseased area, replacing an inactive septic one, results in

* Philadelphia Medical Journal, March, 1902.

rapid cicatrization. Henssel* reports on 60 cases thus treated. He believes it to promote cicatrization and to be harmless to the patient. Gidionsen† uses hetol intravenously, but has found it of no greater advantage than the open air treatment, in fact, he considered it harmful as his cases lost weight and pyrexia was not improved. Max Wolff‡ reports negative results both in animals and in man from the use of hetol and igazol. Franck§ believes in the hetol treatment for early cases only. Onelli‖ ascribes the rapid improvement, shown within a month by a patient in an advanced stage of the disease, to intravenous injections of cacodylate of soda. Among others who have made use of injections of hetol are Krokiewicz¶ and Amrein.** The former thought they produced too marked a congestion and leucocytosis about the diseased area, and he, therefore, substituted the subcutaneous injection in smaller and more frequently repeated doses. He observed better results by the latter method, and when both methods were impracticable, he gave the drug in pill form. Amrein obtained no positive results.

The writer has used, intravenously, hetol, cacodylate of soda, and formaldehyde in 1:5,000 solution in a number of cases. The immediate results are generally unfortunate, a very serious chill and reaction occurring. The mental factor counts for so much in such cases that it is difficult to arrive at any definite conclusion as to the truthfulness of patients' statements, in which they professed to have experienced great increase of appetite and general well-being. The final results in all these cases showed nothing more striking than those to be expected from the infusion of the amount of normal salt solution used as the vehicle. This method of treatment, however, is still in an unsettled and experimental stage, and more complete reports with fuller details will be awaited with interest.

On the theory that phthisis may be due to disordered and diseased pulmonary innervation, May makes subcutaneous injections of silver nitrate in the neck, over the course of the vagus. The side selected for the injection is usually the one corresponding to the diseased lung, or both sides may be injected at the same time if both lungs are affected. The injection is made over or slightly behind the pulsating carotid artery, in the region of the neck, in a line between or near the angle of the jaw and the clavicle and nearer the latter than the former point. Four to seven minims of a 2½ per cent. solution of pure silver nitrate are injected, preceded by five minims of a 2½ per cent. solution of cocaine through the needle, which is not withdrawn until after the silver solution has been introduced. Larger doses have been used when indicated. The injection is followed by swelling, redness and pain. Cough and expectoration decrease, vomiting is lessened, sleep promoted, appetite and general strength increased, physical signs improve, fever diminishes, night-sweats are checked, and there is generally a gain in weight. Of forty cases reported, seven in the incipient stage were cured. Of 18 advanced cases, 5 died; two remain invalids; and 11 improved sufficiently to resume work. Of 15 far-advanced cases, 11 are dead, two are invalids and two are able to work. The writer made use of silver injections, but found that the patients strongly objected on account of the pain and discomfort.

Camphor, in one or two doses of two grains daily, has been given, and improvement in the physical signs as well as the subjective symptoms was noted.

The use of antiseptics in the form of inhalations has been considered another direct method of reaching the tuberculous process in the lung. Here, again, opinion differs as to their efficacy, some contending that, to possess germicidal power, the vapor or gas inhaled must of necessity be too irritating to the mucous membranes. On the other hand, we find favorable reports following their use, especially is this true of formic aldehyde. There are two methods of giving inhalations of formic aldehyde: (1) By use of an oranasal inhaler, which may be worn for many hours during the day and night; into this is dropped 30 minims of a 4 to 10 per cent. mixture of formalin, chloroform and rectified spirit, and renewed every two or three hours. (2) By generating the gas in a closed or partially closed room by means of a vaporizer, while the patient reclines and breathes the atmosphere of the apartment for two or three hours daily. Some advocates claim that it not only disinfects the room and its contents, but that it diminishes the cough and expectoration, reduces fever, and causes the tubercle bacilli to diminish in number, and sometimes to disappear. Of 22 cases treated with formaldehyde inhalations, at the same time enjoying the open air treatment, but no medication beyond a corrective for indigestion, reported by Muthu,* eight were completely cured; nine almost cured; one was slightly benefited, and the remaining four were indifferent.

What is known as "Alabone's Cure" consists of breathing the vapor produced by passing compressed air through tubes and flasks in such manner as to comminute the fluid to be used. In this manner formic aldehyde, menthol, eucalyptol, etc., are supposed to reach the air passages when inhaled. Creosote, ichthyol, and the oils of turpentine and tar as well as other volatile oils are used by inhalation. An effective germicidal action is ascribed to izal which has been given by mouth and as an intratracheal injection. The dose by mouth is two to ten minims given in capsule with five minims of cod-liver oil, once or twice daily. Campbell has made considerable use of it as an intratracheal

* Correspondenzblatt für Schweizer Aerzte, January 1, 1902.
† Philadelphia Medical Journal, August, 1901.
‡ Deutsche medicinische Wochenschrift, July 11, 1901.
§ Therapeutische Monatshefte, December, 1901.
‖ Rif. Med., July 19, 1901.
¶ Klin. therapeutische Wochenschrift, Nos. 2 and 3, 1902.
** Lancet, July 12, 1901.

* Medical Annual, 1901.

injection. As much as three ounces of fluid can be injected at one sitting—one part izal to ten of glycerin. While he reports no cases, he speaks of cures that have been effected.

In the treatment of pulmonary hemorrhage, there has been a decided change from the old style of general and local depletion. The ancient idea was to limit the inflammatory condition by bleeding just as they did in the more acute diseases. This idea gradually gave way to a conserving of strength and an endeavor to limit the amount of blood lost as far as possible. In this day we have not stopped at this, but have hoped by certain procedures to more efficiently control hemorrhage from the lungs. When Murphy announced the possibility of curing tuberculosis by injecting nitrogen gas into the pleural sac to immobilize and compress the lung, it occurred to the writer that it might also prove an ideal method to control hemorrhage. It was soon discovered, however, why it could not be so regarded. To be efficient there must be no pleuritic adhesions or bands, one must be able to definitely locate the point of hemorrhage, which is frequently impossible, and the lung must be capable of compression. The percentage of cases in which this treatment is available is necessarily so small as to render its use practically impossible.

Other means of compression are afforded by applying adhesive plaster bands or even a splint of plaster of Paris or some other material. Pleuritic effusions are at times allowed to remain in the chest in order to continue the pressure they exert on the lung.

Morphine is considered the most valuable drug in arresting hemoptysis. It slows the pulse, decreases blood pressure, relieves the desire to cough, and secures rest for the patient. It is best given in doses of ⅛ to ¼ of a grain, combining the initial dose with $^1/_{150}$ to $^1/_{100}$ of a grain of atropine. The exact action of ergot was not formerly understood, but as it was known to control uterine hemorrhage it was thought capable of controlling hemoptysis. In this it seems we were mistaken. It is rarely as efficient as morphine, and is only indicated when the hemorrhage is supposed to be venous or from a small arteriole.

Other drugs are atropine, nitroglycerin, suprarenal extract or adrenalin, calcium chloride (grains 20 to 30 every four hours), and turpenol, drops three every two hours in milk. When the loss of blood is large, hypodermoclysis or intravenous infusion with normal salt solution, or transfusion, may be practised. It has been claimed by some writers that the atropine in the combination pills of atropine and morphine is responsible for the beneficial effects on hemorrhage, and, with this statement in mind, the writer experimented upon a number of cases with injections of atropine alone but failed to obtain any good results. It may be of interest to state here that the X-rays cause contraction of the arterioles. I am not prepared to claim any beneficial effect from them in hemoptysis, but I do know that in one case of uterine hemorrhage, in which bleeding occurred almost daily for three months following an operation, the application of X-rays effectually checked the hemorrhage, and the menstrual function became normal after seven exposures to the rays. An effect also noted in cancerous and other sanguineous discharges is that, under X-ray treatment, they decrease materially in quantity.

Experiments looking to the control of pulmonary hemorrhage have been made with subcutaneous injections of gelatin. Of those who have thus far made injections, the majority regard them as harmless, though there is no evidence that they are really useful. It is important that the gelatin used should be perfectly aseptic. The possible dangers of such injections are embolisms, necrosis and tetanus.

S. G. Bonney* believes that hemoptysis in consumption is less likely to occur at high altitude, but it may be more severe and cause greater shock than at sea level. In support of this statement, the writer recollects having seen patients at a moderately high altitude, who had had a number of hemorrhages at short intervals while living at sea level, in whom the hemorrhages disappeared entirely after reaching an altitude above 2,000 feet.

In hydrotherapy we possess an agent of considerable usefulness, both as a prophylactic and in the early stages of the disease. This does not mean that it is to be neglected in the more advanced stages. The primary idea is to produce a reaction of the skin and to promote cutaneous circulation. The degrees of application vary from bed baths and flagellations in those who are weak and confined to bed, to the needle spray, shower bath and spinal douches administered under a certain degree of pressure. It is important that the skin should be in such condition as to secure proper reaction. The surface should be warm or even moist. In the healthy, exercise immediately preceding the bath will be sufficient. In othres a stay in the sweat-box, in which the temperature can be raised to any degree, is necessary, while for those confined to bed, wrapping tightly in blankets from head to feet will answer the purpose. The shock caused by dashing cold water on the warm body, followed by reddening of the skin, stimulates the patient, makes him less susceptible to draughts, induces more natural sleep, increases appetite, and produces a general feeling of well-being.

The value of urea in tuberculosis is, as yet, undetermined. Harper,* believing that gout and its allied diseases are antagonistic to the tuberculous process, and that those afflicted with the former diseases possess a natural antitoxin against the bacillus, supplies an excess of urea to those with tuberculous lesions by encouraging them to partake of certain foods rich in urea, namely, kidney, liver, and calves' or sheep's

*MEDICAL NEWS, October 1, 1901.

brains. In addition, he gives twenty grains of pure urea, dissolved in three ounces of water. Buck* reports good results in cases treated along this line.

The success of zomotherapy, or the treatment of tuberculosis by the ingestion of raw meat, probably depends upon the correctness of the above theory. It is stated that a somato-antitoxin exists in muscle plasma or serum, and is resistent to the tubercle bacillus. However, C. Frankel and G. Sobernheim† tested it in animals, and discarded it as unworthy of further experimentation.

Postural treatment has been proposed by Schenk‡ to promote hyperemia of the lungs. He elevates the foot of the bed twelve inches, and applies warmth to the chest by means of water coils, at the same time sponging the hands, feet, and abdomen with cold water. His theory is "That tendency to phthisis depends . . . upon a relative cardiac insufficiency, leading to a defective circulation through the lungs, and that those who suffer from pulmonary hyperemia, as a result of valvular disease, are comparatively immune."

Operative treatment, such as the aspiration of cavities followed by the injection of drugs, opening and draining of cavities, and the resection of diseased areas of the lung, have been attempted with no encouraging results. They may still be considered on trial. One great drawback to operative procedures is that those cases generally selected as suitable could, undoubtedly, receive as much benefit from less dangerous measures. Inunctions have not been neglected, the favorite drug used in this manner being iodine in one of its unstable forms.

In pyrexia, with so many other remedies at hand, it seems hardly advisable to administer antipyretics for the purpose of simply lowering the temperature. They may prove depressing while almost equally good results may be obtained from cold sponging and rest.

Night-sweats usually disappear on general improvement of the physical condition of the patient. If special measures are necessary, atropine will be found most useful. The mineral acids, tellurate of sodium ($^1/_{12}$ to $^1/_2$ grain daily) agaricin, may also be used, while bathing with cool water, alcohol or a weak solution of formalin may be of service. When the sweats are due to a septic condition in the lung, antiseptic inhalations are advisable, and serum for destruction of germs as well as intratracheal injections in cavity cases.

Cough can be sufficiently controlled by mental suggestion or by codeine, dionin, or heroin. In advanced cases, however, it may be necessary to resort to posture and massage of the chest.

Summary.—With our present knowledge and clinical experience in the treatment of this disease, diet, hygiene, and fresh air are universally accepted as the foundation of all scientific treatment, although it is equally acknowledged that, by themselves alone, they are not sufficient, but must be supplemented by symptomatic treatment in the way of antisepsis, tonics, and surgical interference when necessary. The probability is that within the next three years, we will see notable advances in immunization and the stimulating effect of light. In the meantime, the physician who would prescribe climate alone is equally culpable with him who would ignore climate, diet and hygiene in favor of medicinal or other treatment. The man who would justly earn the gratitude of his patients will be he who will prescribe a judicious, scientific combination of the two basic lines of treatment.

25 East Forty-fifth Street.

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‡ British Medical Journal, Sept. 28, 1901.

HYSTERIA AND ORGANIC DISEASE.

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VALUABLE addition to our knowledge of hysteria may be obtained by following a few typical cases over a long period of years. Not only in its etiology but clinical history hysteria presents a mixture of both physical and mental symptoms. Earlier writers sought for and not infrequently found causes and symptoms that were distinctly organic. More recently chemical and cytological changes in the tissues have been looked for. The trend of the work of the French school, especially of such writers as Janet, Sollier and others, has been in the direction almost exclusively of a purely psychological interpretation of hysteria. The studies of suggestion and fixed ideas are the two lines of research that explain the problems of hysteria, and these we owe chiefly to the French.

Notwithstanding the enormous variety of the symptoms of hysteria, one common trait appears in all cases of this disease, perhaps the only one, and that is the possibility of its being reproduced by suggestion with rigorous exactness in proper subjects and of being dispelled by suggestion. "Man," as Boris Sidis states, is a "suggestible animal" and no matter how normal he is, if his attention is fixed, and distracted by some monotonous impressions, and if his voluntary movements and field of consciousness are limited, and his ordinary flow of thoughts inhibited for the time being he yields to suggestion. In the normal state a suggestion is more effective, the more indirect it is, and in proportion as it becomes direct it loses its efficacy. Or as Sidis states it, "normal suggestibility varies directly as indirect suggestion and inversely as direct suggestion." The Nancy school defines hypnosis as heightened suggestibility. Abnormal suggestibility varies directly as direct suggestion and inversely as indirect suggestion.

In normal men, the superior and inferior centers of the mind work in harmony, meaning by the upper, the will or choice centres or in other words the controlling and inhibitory centers. Physiologically, hypnosis is an inhibition of the inhibitory centers. It is a disaggregation of the superior from the inferior centers, necessarily followed, as in the removal of inhibition in general, by an increase of the ideomotor and ideosensory reflex excitability. Psychologically hypnosis is the split-off, disaggregated, organic reflex consciousness pure and simple.

Charpentier uses the word suggestion implying something harmful, and the word persuasion for suggestion that is in harmony with reality or good sense. For example, suggestion that a patient's arm will be or is paralyzed, persuasion that it will be cured. He defines hysteria as a psychical state rendering the subject who suffers from it capable of auto-suggestion, and the hypnotic state rendering the subject who undergoes it, susceptible of receiving direct suggestion from another.

Thus the purely psychological interpretation of hysteria explains its etiology in terms of suggestion and its primary symptomatology in the line of fixed ideas. Since the thoughts of a hysterical subject are rarely in a state of equilibrium, but unevenly balanced and subject to varying influences, one line of thought can readily develop in a manner so exaggerated and intense as to persist indefinitely to the great detriment of the mental and bodily health of the patient. This line of thought may become the condition of fixed idea or imperative concept which even to an uneducated observer is well beyond the borderline of sanity. In its extreme, hysterical psychoses resembling paranoia or other definite types of insanity may develop. Apart from these definite psychoses many less advanced cases of motor, sensory or visceral symptoms can easily be explained on the same psychological hypothesis. Bernheim calls attention to the fact that the serious symptoms or "grand crises of hysteria, are merely an exaggeration of the ordinary psychical and physiological phenomena seen under varying circumstances in normal human beings. He defines a hysteric as a subject who has a hysteria breeding or hysterogenous constitution, "appareil hysterogene" well developed and easy to be worked upon.

The clinical syndrome caused by exciting or depressing the nervous and psychical centers, developed by a shock or mental strain of any sort, instead of being temporary as in normal subjects and quickly disappearing, appears more quickly and readily degenerates into a prolonged attack with such general symptoms as convulsion, delirium, syncope, changes in sensation or local symptoms varied according to the individual condition of one or another organ. Hysteria, he states does not exist by itself. The hysterogenous state exists and various so-called hysterical symptoms may arise. It is characterized by a series of reactions, both physical and mental, and in a hysterogenous constitution, under certain causative influences, such as sudden moral or mental strain, or a more gradual impression, by the condition of nervous anxiety. All kinds of depressing impressions, whether they be such as are created by an incident of life, or suggested by an obsession of a fixed idea, are effective when focused on a hysteria-breeding constitution. Such general and local depression of a nervous nature, whether sudden or gradual, awakens latent hysteria in different ways. Vague sensations of discomfort or distress located in certain organs, or even an appreciation of their existence, and physiological activities, which normal people have no special knowledge of, a feeling of oppression, neuralgia, cramps or any other disagreeable sensation, form a substratum upon which basis, in a hysterogenous subject, hysterical symptoms may be built up.

Nervous anxiety may not always be present. Special impressionability of the potential hysteric ought not to be confounded with neurasthenia. The mind may be of a type prone to exaggeration and romance, but may seem morally and mentally normal. All the ideas are suggestible or autosuggestible.

In the symptoms resulting, what Richer calls a diathesis of hysterical contracture is apt to be present. While the patient presents no objective signs and preserves freedom of movement, the manifestations of his trouble may be brought on by the manipulation of his physician or some chance occurrence. This condition of the neuromuscular system partakes of paralysis in that it usually coincides with a weakness of motility, and of contracture in that the slightest excitement will bring it on, or cause it to disappear. It has been called latent contracture.

A second common condition in hysteria is seen in the vasomotor phenomena such as the flushes, morbid blushing, sensation of heat or cold on the surface of the body. In a case of typical traumatic hysteria seen by the writer a short time ago, showing well marked hemi-anesthesia and contracted visual field, over an area where a contusion had been sustained two years before, but where no scar or permanent injury was visible, an area of redness of the size of a half dollar would appear whenever she was subject to a strong emotion, and was especially noticeable when she sat in the witness stand. Here autosuggestion in producing definite paralysis of the vasoconstrictor nerves over a limited area, was absolutely demonstrated. In these cases salivation, local hyperidrosis, pallor, or hot or cold extremities are common. If the same vasomotor phenomena take place in the general sympathetic system, especially in the splanchnic or cardiac plexus, serious trouble from some of the internal organs may occur. Flatulence, palpitation or irregularity of heart are common examples. Fränkel reports several cases of death from such cases of hysteria with special interference with these

important parts of the sympathetic system, with no organic lesion of any sort found at the autopsy.

Edema of the lower extremities, from this cause, and if the spasm is prolonged, even local gangrene, as in Raynaud's disease, may occur. Many dermatoses of hysterical subjects, most frequently of the urticarial type show this reaction. Herpes especially herpes preputialis, occurring as it does in thoroughly neurotic subjects, and various familiar or rare types of skin diseases mechanically produced by vasomotor fluctuations can be classed with these conditions.

Given a neurotic subject, neurotic from bad heredity, or mal development passing through any of the critical periods of life, such as puberty, adolescence, pregnancy, the menopause, or old age, with the resisting power none too strong, and hysteria is almost inevitable if the subject has a hysteria breeding constitution.

Take a common example of the first or second period. A boy or girl falls into a state characterized by self-centered mentality, irritability, inability to work; anorexia, gastralgia, vomiting, or the symptoms described in detail in the patent medicine advertisement occur. Typical symptoms of hysteria, contractures, anesthesia, crisis or paralysis of one sort or another may follow. The condition is a neurosis of development. It is based on autosuggestion or unconscious imitation as a rule. It may be associated with toxemia of some sort. Sometimes the patient is able to suppress every symptom of a nervous nature except the anorexia, which may persist as an obsession which cannot be resisted. The moral inertia of such cases may persist until the cyclic evolution of the youth is completed.

Whenever, in such a case as this or in any other nervous or mental disease, anorexia becomes one of the definite symptoms, grave changes of the physical condition will result, such as emaciation, weakness or any objective and subjective symptoms ordinarily caused by starvation, of which anemia is the most frequent and serious condition.

Neuroses and psychoses of old people whether during the menopause, or the senile period are frequent. At this time hysteria is associated with such changes in the tissues as arteriosclerosis, aortic insufficiency, angina pectoris, asthma, and acid dyspepsia. Frequently the patient is not naturally hysterical or hysterogenous. Progressive changes of the patient in the last years of life, render the hysteria breeding constitution more impressionable. Hysteria is not created by the arteriosclerosis, but a hysterical diathesis is revealed by it and the capacity for resistance is decreased by it.

In women who have hysterical tendencies, the menstrual period with its physiological depression, is a time specially liable to develop definite hysteria, just as those prone to epilepsy, or even uricacidemia present their most marked symptoms at this time. Physiological congestion of the ovaries and minor displacements of one or another of the pelvic organs, have their effect in severe pain and other nervous symptoms which may be definitely hysterical. The whole train of what the patients term "female complaints" are a vicious circle in which hysteria is an omnipresent factor. It is difficult or impossible to state in a given case which is the primary and which the secondary factor.

A normal menstruation is not sufficient to reduce the number of red corpuscles in the blood, for, like all other slight hemorrhages, it sometimes increases the number of red cells and the hemoglobin. If other causes of anemia are added, a slightly disordered menstruation rapidly reduces the number of red cells, and hemoglobin, and definite anemia results.

General observation convinces every one that the two types of women from whom we expect hysterical symptoms, are the anemic and the poorly nourished women, and the fat women with hydremia; the latter look as if their color was good, but the mucous membranes or blood count show anemia. Ewing states that functional nervous diseases, such as hysteria, neurasthenia or hypochondriasis do not give rise to anemia, though associated conditions may lead to impoverishment of the blood.

In cases of hysteria associated with gynecological disorders, the gynecological lesions are presumably primary. Fibrocystic ovaries are common in later life without causing pain or nervous symptoms, and yet the same pathological condition may be associated with or cause intense neuralgic pain. And, as nearly all cases of hysteria show, the commonest of the so-called stigmata of hysteria is the "ovarie" or sensitive ovary, a similar painful area being frequently seen in male hysterics.

Practically all diseases can become hysterogenous especially those of the nervous system. Chorea and epilepsy frequently breed hysteria, and the symptoms of chorea and epilepsy can usually be proved to precede the hysteria. If they coexist, each disease preserves its distinct symptoms.

Tabes, hemiplegia following cerebral lesion, definite muscular dystrophies, all may be hysterogenous and have distinctly hysterical symptoms engrafted on them. Alcoholism and other toxic conditions, in hysterogenous subjects, can present a mixture of symptoms, which are not easily separated. It is usually as inaccurate to speak of alcoholic hysteria as hystero-epilepsy.

Admitting that various diseases may be hysterogenous, is the converse true? In typical cases of hysteria, in the course of time definite organic symptoms must appear. All hysterical cases must eventually die of something. What is the relation of hysteria with cardiac, urinary or intestinal symptoms which are obviously hysterical, to such genuine and ultimately fatal lesions as organic disease of the heart, the kidneys, or other organs? Naturally it is in the severer type of hysterical attacks that definite impression on the organs should be expected.

The symptoms of hysteria which appear in the earlier part of the history of a case are as a rule of moderate intensity, do not alter consciousness extensively, and even if they last a long time, eventually disappear. The hysterical seizures or attacks are just the reverse. They are acute, they make decided alterations of consciousness, they are momentary or last but a few hours. These attacks are fairly well known on account of their startling character and the necessity of distinguishing them from other convulsions of a far more serious nature. Not only the physical symptoms become more definite, but there will develop some modification of the respiration, circulation, and all organs under the control of the sympathetic nervous system. Janet makes seven types of hysterical attacks: (1) emotional seizures; (2) attacks of tics or clownism; (3) attacks of fixed ideas or ecstasies; (4) complete attacks, hysteria major (Charcot); (5) automatism in the attack and in the fixed ideas; (6) somnambulism; (7) delirium.

The first physical change resulting from convulsive disease may be looked for in metabolism and especially in the urinary secretion. Hysteria is always associated with such modification. Polyuria of a low specific gravity is one of the most constant physical symptoms of hysteria. Long-continued reduction of the total amount of urea is described by Janet and others, and the reduction may last for months (two grams daily in a total of 100 grams of urine). Other cases continued to pass less urea than has been supposed possible for any length of time without fatal results. Charcot reported anuria in a hysterical case lasting eleven days without any symptoms of uremia. Lowenfeld explains this as due in some cases to diminution of metabolism and the slight production of the material that causes uremia. In other cases, or perhaps usually, the most reasonable explanation is the cramp of the vessels of the kidney, like the vasomotor disturbances previously alluded to, which are so common in hysteria, and in this case easily modify the secretory function of the kidney to a greater or less extent. The typical urine of hysteria is large in amount, low in specific gravity; the solid ingredients, such as urates, phosphates, chlorides are diminished to about one third of the normal; and the ratio of earthy phosphates to alkaline phosphates instead of being 1:3 are 1:1. In a recent experimental study by Castaigne and Rathery in *La Semaine Médicale* it is stated that lesions were found in the kidney wherever polyuria was known to have existed during life, and lesions were found in rabbits every time polyuria was induced for a certain length of time.

Albuminuria may be found after violent convulsive attacks. This is common after violent epileptic attacks. Galanti, in repeated examinations of the urine of 16 epileptics, found, after the epileptic seizures, albumin in quantities varying from 0.05 to 2 per cent. The duration of the albuminuria was from four to six hours. If albumin was present in the urine of these patients, it was much increased after the attacks. He explained the albuminuria by (1) renal stasis secondary to the initial stage of the fit and the dyspnea; (2) by cerebral excitation at the cortex and bulb; (3) by the toxic influence upon the renal epithelium; (4) by change in metabolism and intestinal toxemia; (5) by the intense muscular work. Nearly all these factors are present in a severe hysterical attack. That albuminuria may be associated with hysteria, whether as an etiological factor or, as is more probably the case, as a result is illustrated by the following case under observation by the writers of this paper and many physicians in Brooklyn:

The patient was a trained nurse, aged twenty-five years, born in Scotland. Her father is neurotic, and somewhat of an invalid from chronic bronchitis. Her mother was at one time insane and died of phthisis. Her previous health was good. She was addicted to the excessive use of coffee. She suffered from great mental depression after her mother's death, shutting herself up in her room for several days, and also from the effects of a severe contusion of the knee, for which she wore a knee-cap for a long time, because she believed it had been fractured. When she entered the training school, her fellow nurses say that she appeared somewhat slow mentally, studious, absentminded, and forgetful. They had not considered her as especially nervous in temperament. Although she studied hard, she seldom learned her lessons perfectly and this worried her. She was well liked on account of her sweet, obliging disposition and manners, and her desire to do her work well. She had an unfortunate love affair while in the training school, which affected her severely. At this time some slight breach of the rules of the hospital, which caused her to be reprimanded, had the effect of making her feel that she was an ill-used person, and made her crave sympathy and consolation from others.

December, 1899, she came to the Brooklyn Hospital from outside nursing, complaining of symptoms of influenza. After working a few days more she returned complaining of pain in her eyes. She said she had been nearly run over by a trolley car, because she could not see it. But immediately after this had happened, she was seen to look up an oculist's address in the telephone book. She was under his treatment for some weeks for internal strabismus of the right eye. About this time she had an attack of nausea and faintness in the doctor's office, associated with feeble heart action and alarming general symptoms. During the following days, though working, vertigo and unsteadiness persisted. Four days later the patient was suddenly seized with convulsions which were diagnosed by two physicians as uremic, though their examination of urine had been insufficient. She was sent to the Brooklyn Hospital in an ambulance, chloroform being administered en route. She reached the hospital unconscious. Her respiration was deep and stertorous; her pulse 88, soft and moderately

forcible. Her temperature was 100° F. She was put in a hot pack for a while, reflex movements occurring while in it, but little diaphoresis. Examination of urine showed no albumin; a specific gravity of 1.036, abundant urates and phosphates. As it reduced Fehling's solution a conjectural diagnosis of diabetes was made, but before the result of this examination was reported, the patient reacted to supra-orbital pressure and cried out when allowed to inhale aromatic spirits of ammonia. No glycosuria was present, the examination having been made hastily by gaslight.

She remained in the hospital for six weeks; her mind being clouded most of the time. At the time of her discharge her bodily health was good but the ocular symptoms returned. There was internal strabismus of the left eye. The pupils reacted to light and distance. The patient complained chiefly of diplopia. Some observers diagnosed her case as tuberculous meningitis. The mental symptoms improved, but loss of memory and inability to recognize her friends or name them correctly persisted. She improved but complained constantly "that people did not seem the same." A nurse in the hospital gained a remarkable control over her, so that the patient was said "to have been hypnotized by her." No new physical symptoms were recorded and examination of her urine was always negative.

After her discharge from the hospital, the patient remained in good health excepting her memory. She went abroad and joined her family, but suffered considerable fatigue and nervous strain, however, from having to nurse her father through pneumonia. A year later she came to a New Jersey town to nurse a confinement case. Unexpected delay and responsibility in connection with this case worried her very much.

October 7, 1900, she was found on the kitchen floor in clonic convulsions. The movement of the limbs were rhythmical, making rather small uniform excursions. There was some opisthotonos, the head rotating slightly. The eyes were wide open, turned to the left, the pupils dilated and fixed, but there was no strabismus. The facies was dark and cyanotic. The fists were clenched and the thumbs turned into the palms. The pulse was imperceptible. The movements became weaker until the patient lay quiet but seemingly comatose. A prick of a needle, administering a hypodermic of apomorphine brought on another convusion lasting fifteen minutes. Chloroform had to be administered. She was taken to the Mountainside Hospital in an ambulance, showing on examination that her tongue was bitten, she had suffered contusions and ecchymoses from the convulsions and had micturated involuntarily. She had in all three or four distinct convulsions, the first one having been ushered in by a pain in the bowels and headache and general malaise.

The urine was examined by the pathologist of the hospital, and was found to contain a considerable quantity of albumin (1 per cent. by weight), and the specific gravity was 1.015. Thirty-two ounces had been passed in twenty-four hours exclusive of what had been lost in the stools. She had a few hyaline and granular casts.

The record of the first night was marked only by some involuntary micturition, occasional vomiting, and a mental condition dazed or mildly delirious, at times uncontrollable. She was sent to the Brooklyn Hospital soon after, going quietly with her friends and recognizing the people in the hospital but not realizing where she was. The records of the hospital give the following account of her condition on admission.

General appearance and attitude, well nourished, nervous and restless. Cheerful manner, mannerisms or peculiarities of dress or posture. Reaction to surroundings interested, to questions fairly coherent, attention fair, content of thought not absolutely fixed but centered upon her father's voice who kept calling to her from the next room. Consciousness, orientation for time absolutely lost; she said she had been in the hospital for three years. Orientation for persons and places also defective. Confused memory for both past and present events. Interest and judgment not apparently affected. Fancies she sees persons not present; hears voices that are not existent. The hallucinations of sight and hearing are fairly constant. No depressive, expansive or fixed delusions. Emotional condition, not especially disturbed. Physical condition: No stigmata recognized. Reflexes normal.

For a fortnight her urine showed in five examinations a faint trace of albumin with granular and hyaline casts. The examination showed no changes in sensation or reflexes excepting the loss of the palate reflex. Two weeks later the patient left the hospital "improved," with a diagnosis of "hystero-epilepsy." The diagnosis in the same institution some years before having been hysteria.

One year later the patient was seen to be in apparently good health and had grown somewhat stouter. She had been able to work and had not been sick excepting for a period of three days, when she had been living in a nurses' boarding house. Her mind was a blank for these three days and she does not remember what happened. A physician consulted by her diagnosed some gynecological condition and treated her for it, advising an operation. She still has headaches and these are at times preceded by pain over the ovarian region, and characterized by feeling of great pressure across the eyes. Repeated examination of the urine shows no albumin or casts. She is at times constipated, has some leucorrhea. There is no gynecological lesion at present existing. She still dreads another "turn," which has not appeared for a year. The family surroundings and improved prospects have doubtless helped to bring this improvement about.

This case, related in detail, presents marked difficulties of diagnosis as between organic disease, such as uremia and functional nervous disease, and again, still greater difficulty if one would discriminate between hysteria and epilepsy.

The symptoms of her convulsive attack carefully summed up in parallel columns in the style of text-book diagnostic tables, which compare epilepsy and hysteria give out of 18 points, 5 unmistakably referable to hysteria and 11 to epilepsy. The fact remains that the clinical history followed over a period of years clearly proves that it is the record of one suffering from hysteria in ever-varying phases. There comes a time when careful and repeated examination of the urine shows for a brief period the casts and albumin, usually associated with definite organic disease of the kidney.

The supposition that there was nephritis as an underlying cause of the whole train of symptoms, or any important part of the symptoms, cannot be maintained, however.

Case II.—M. S., an American Hebrew, of the dark and handsome features type; giving a definite neurotic family history. He had recently passed through serious business trouble and had lost most of his money. When first seen by the writer he announced that he was about to have "one of his colics" and requested that if he should, ether or chloroform be administered to him, as morphine always crazed him. He said he had had a stone crushed in his bladder. He had had numerous "nephritic colics" and had traveled all over Europe to various health resorts. He had passed no stone recently. Then ensued a series of the most violent attacks imaginable attended with intense pain in the region of the kidney, running down to the penis. He was extremely nervous and after injections of morphine, he became so wildly delirious and unmanageable that he tried or pretended to try to throw his physician out of the window. Local examination showed a sensitive urethra, an enlarged and tender prostate and tenderness in the region of the left kidney. The urine contained the faintest suggestion of a bloody shred or clot but no hematuria or stone. During this and succeeding attacks his manner was what is commonly called "hysterical," though he showed no hysterical stigmata. After frequently recurring attacks of the nature described, all physicians associated with the case being fairly worn out by the way he yielded to them, and his obvious danger of incurring the opium habit, I talked with extreme frankness and roughness to him about it, telling him, what I only half believed myself, that he was imagining the whole thing. I never saw him for six months, when, meeting me on the street, he told me that the talk had been the "turning point of his whole life," and that he had never had an attack since.

The early history of this case was positive as to his having had a calculus. Admitting the organic basis of his earlier trouble, he was a neuropath, had a "hysterogenous constitution" and was undoubtedly perpetuating his genuine nephritic colic indefinitely as a hysterical echo until "called down" and shamed into common sense. All surgeons who have operated for stone in the kidney and after cutting down, have found no stone or any other lesion of the kidney will find in the features of this case many points that resemble their own cases. It seems reasonable enough to conclude that insignificant trouble in the kidney, or anywhere else may, in a neurotic subject, by concentrating his thoughts to that region produce puzzling hysterical-organic symptoms.

VARIETIES OF PULMONARY TUBERCULOSIS.

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MOST text-books give no divisions of pulmonary tuberculosis, which are of practical value either in prognosis or treatment, merely stating that some cases recover and certain cases die. The results in our sanatoria show that some apparently early cases fail to recover, or sometimes even to improve, under the excellent treatment which is given them. Some patients leave home and rough it and get well; others go away and, under the same conditions, fail and perhaps die. Many, as shown by autopsies, have the disease and recover without knowing that they have had it; others are near death before the disease is recognized.

During the past few years no disease has received greater attention or had more able minds devoted to it than has this same old scourge, consumption, and though much remains to be learned a more accurate knowledge of the disease is being obtained. A careful study of the pathological aspects of tuberculosis has shown the relation between the early and the healed process, also the condition of the lungs in arrested cases. The chronic, slowly progressive cases, the rapidly progressive localized cases and, finally, the general infections, have been thoroughly studied pathologically and are familiar. Now the problem is to learn to recognize these forms from a clinical point of view early in the process, for by doing this we come as near as is possible to being able to give a reasonable prognosis. Ability to prognosticate the probable course of the disease is of vital importance and will save many of the mistakes now made in sending patients far from home and among strangers to endure unnecessary hardships and disappointments, and will also aid much in individualizing treatment.

Putting aside for the moment the fact that patients with pulmonary tuberculosis can recover at home, the day is far past when it was justifiable to send patients away to face unknown conditions simply because they were found to have tuberculosis. No climate is a cure-all for any case of tuberculosis, and no climate is of advantage to all forms of it. No one treatment will benefit all cases of pulmonary tuberculosis, and the treatment which will cure some is a positive injury to others. The successful handling of a case of pulmonary tuberculosis, whether such handling consists of advice as to where to go for treatment or of the actual treatment itself, depends upon a recognition of the form of the disease and its probable course and upon the

characteristics and condition of the individual; not upon the single fact that he has tuberculosis. The known individual and not the disease should be treated. The writer has been trying for some time to get a classification of cases of pulmonary tuberculosis and from a study of his own patients and from the recorded experiences and researches of others has accepted the following as a general classification. Of course these forms are not absolute but merge into each other, and, indeed, different forms may be found in different localities in the same individual at the same time, or the disease may be masked by accompanying conditions in the lung, as bronchitis or emphysema. Yet a classification will do much to help us avoid mistakes and in other ways benefit our patients.

First: Localized fibrous form.—Nature's way of cure is by fibrous tissue, and these fibrous cases are the favorable ones. The disease begins in mucous membrane or pleura and fibrous tissue forms and encloses the diseased tissue, the fibrous extending much farther than the tuberculosis tissue. There is little or no necrosis of the lung tissue and little mixed infection. The process is slow and may be sharply localized or may become widespread. These are the most favorable cases and the ones that can endure the most vigorous treatment.

All cases which recover or improve give a certain amount of fibrous thickening, and the most favorable of all are those having a sharply localized tuberculous focus, usually at one apex. Fibrous thickening of that apex occurs and segregates the disease from the healthy tissue. Cavities may occur, hemorrhages may take place and caseous matter may be expelled; yet the disease remain localized. The apex may be considerably affected and recovery still take place because, not only does the shutting off of the disease area by fibrous tissue prevent the spread of the infection but it also limits the absorption of poisonous products into the circulation, thus preventing much of the possible constitutional involvement. Even though the original infection is quite severe, so that, before the fibrous tissue has time to form, a considerable tuberculous mass is present which later breaks down and forms a cavity of appreciable size, we have the disease arrested, and in time perhaps cured, if the lung has the ability to take on a marked fibrous change about the diseased area.

Usually, by the time these cases come under observation so as to be recognized the fibrous tissue has begun to form, and we get slight dulness with some râles especially after cough, and harsh breathing with prolonged expiration at one apex, with slight constitutional involvement. That is, the actual consolidation is slight; harsh breathing beyond the râles shows the fibrous involvement and the lack of systemic poisoning shows the lack of absorption. Cases in this stage are the most encouraging for climatic or other treatment and the majority of the cases the writer has seen recover have been of this form.

Second: Fibro-caseous form.—The disease may take on this fibrous form and arrest occur after a considerable portion of the lung substance has become affected. Then we have the formation of a large cavity, contraction of the lung, and, if it is on the left side, the uncovering of the heart. Even with marked local disease the patient may live a long time in fair comfort, but with lessening of the breathing capacity, shortwindedness and debility. Or, without the formation of a large cavity we may get an extensive thickening of the lung substance by the formation of fibrous tissue and marked contraction of the lung. This may be limited to one side or there may be bilateral involvement. This condition as the localized fibrous form, may become stationary and the patient live years with a lessened vitality, but, under favorable conditions in fair comfort, a little wheezy, perhaps, but, by the avoidance of dust, smoke and all excesses, may enjoy a quiet, hygienic and comfortable life.

Third: Fibroid phthisis.—Generalized fibrous form.—How far these cases are of tuberculous origin seems to be a subject for further study. The writer believes that many, at least, begin as a result of some other irritant than the tubercle bacillus and that when this is present it is as a secondary feature of the disease.

In these cases there are general fibroid changes throughout the lung. They run a chronic course and are found chiefly among persons exposed to the inhalation of irritating dust, such as miners and workers on emery wheels.

Fourth: Phthisis florida.—This variety is without the formation of fibrous tissue. It begins with a profound and active infection, is not shut off from the healthy lung tissue, the blood vessels are not closed by the growth and contraction of fibrous tissue and the absorption is marked. The patient becomes cachectic and has a high fever from the toxins of a mixed infection. The disease shows only very temporary abatement or none at all and the patient dies of toxemia without the disease spreading to other organs.

*Fifth: Chronic parenchymatous tuberculosis.**—Closely associated with phthisis florida is what Dr. W. N. Biggs, in the MEDICAL NEWS of April 25, 1903, describes as "chronic parenchymatous pulmonary tuberculosis," corresponding with Powell's "chronic tuberculous phthisis." This is the form which is most frequently sent from home to die. The onset is very insidious and it is the form which most frequently escapes detection in the early stages, being diagnosed by the patient or physician as "debility," "anemia" or "bronchitis." The disease begins and spreads in the intra-alveolar tissue without much involvement of the bronchial mucous membrane and is accompanied by very little secretion, giving little or no cough and expectoration unless non-tuberculous bronchitis is also present. There is an induration of the alveolar walls and a more

* I do not like the name "chronic parenchymatous tuberculosis," but as this name has already been used and I have no satisfactory substitute, I use it.

gradual necrosis than in any of the other forms except the fibrous. Although there is a thickening of the walls of the alveoli, there is not a distinct fibrous formation and no shutting off of the diseased area by a fibrous wall. The early stages are marked by a slight or moderate rise of temperature, anorexia, anemia and loss of strength, while there may be but little loss of flesh until the disease is advanced. Hemorrhage is rare. On physical examination, even in cases past the initial or incipient stage, we find on percussion but slight impairment of the resonance or of vocal resonance and fremitus. As the alveoli are not filled to any extent there are no signs of consolidation and there is no cavity formation. The disease is steadily progressive and later we get some dulness, but not flatness. Then the breathing is harsh, but not the bronchial breathing of consolidation, with subcrepitant or sonorous râles followed by coarse, moist râles. If the affected area is contiguous to the heart, the heart sounds will be transmitted with abnormal distinctness. The heart is usually rapid out of proportion to the fever. A prominent characteristic of this form of pulmonary tuberculosis is the marked general symptoms as compared with the physical signs as given by auscultation and percussion. This form is less rapid, though but little, if at all, less fatal than phthisis florida, and patients thus suffering should not be sent away from home with any idea of cure, and should never be sent away alone. They cannot stand as vigorous a treatment as is beneficial to the fibrous cases.

Sixth: Acute miliary form.—This may exist by itself, as where a bronchial gland breaks into the pulmonary artery, or as a part of a general miliary tuberculosis. Here we get a condition throughout the lung similar to the parenchymatous tuberculosis which is local in one part of the lung in the beginning. The miliary form does not advance to the stage of dulness and mucous râles before the system is overwhelmed by the absorption of toxins. The physical signs are those of the early stage of the chronic parenchymatous form, except that they are general instead of local.

POISONING BY THE WHITE OF AN EGG.

BY J. R. CLEMENS, M.D.,
OF ST. LOUIS, MO.

THAT the condition or rather idiosyncrasy of poisoning by white of egg must be a very rare one is evidenced by the fact that no mention is made of it in the literature, even Vaughan and Novy's "Cellular Toxins" being appealed to in vain. The case I am about to record is interesting from the difficulty of the differentiation of the cause and from the extreme susceptibility of the patient to the effects of even minute traces of egg albumin in the gastro-intestinal tract, the gravity of the seizure being apparently out of all proportion to the exciting cause.

The patient, a child of fourteen months, during a moderately severe attack of whooping cough that was already declining, was suddenly seized one afternoon with an attack of acute urticaria and alarming collapse, the face and ears being greatly swollen and the radial pulse withdrawn from the wrist. The child was apparently moribund, but hypodermics of strychnine tided over the crisis. Later the child vomited the contents of the stomach: water and mucus. The pupils were widely dilated during the attack and the face pale. The child rallied slowly and was the source of anxiety for the following two days.

Antipyrin and the vapo-cresolene lamp were laid under suspicion and both discontinued. Some two weeks later an exactly similar attack was experienced and this time, as both antipyrin and carbolic acid intoxication could be excluded with certainty, other causes for the condition were sought for in vain. A month later the child, after partaking of some custard, suffered within half an hour from an acute attack of urticaria of the face and ears with vomiting and purging. The cause of the attack was now evident. Three days ago, after eating a small piece of gingerbread cake, in the making of which two eggs had been used, the child was noticed to be limping and on examining the feet both were found to be extremely swollen and purpuric, petechiæ and ecchymoses extending up as high as the middle of the legs. There were no nervous symptoms.

Treatment consisted in cleaning out the gastro-intestinal tract with oil, followed by full doses of calomel as an antidote and later by salol and magnesium sulphate. The recovery was uneventful, the edema of the feet rapidly disappearing, although the child was allowed to stand and walk.

Points of interest bearing on the case are the facts that the kidneys are sound and that each attack was preceded by weeks of intestinal indigestion as evidenced by pale stools, flatulence, flabby muscles and broken sleep, a great amount of indican being observed in the urine. A short time prior to each of the first two alarming attacks the child had been given the white of an egg with his milk, which was an innovation. Whether the child would prove immune to eggs when in full health is an experiment I have no desire to make.

All four attacks were without incubation periods and must therefore have been intoxications. Atropine was contraindicated by reason of the condition resembling that of atropine poisoning. The family history is negative in regard to any such idiosyncrasy. The possibility of a future attack expending itself on the larynx must ever remain a cause of anxiety.

Dr. Bull Resigns from Columbia.—Dr. William T. Bull tendered his resignation on Monday last as professor of surgery at Columbia University, to take effect June 30, and it was accepted. Dr. George E. Brewer, professor of clinical surgery, was assigned to a seat in the faculty of medicine. Dr. T. Matlock Cheesman was elected a trustee to succeed Dr. Edward L. Trudeau.

MEDICAL PROGRESS.

MEDICINE.

Antimalarial Operations.—Tropical medicine is apt to become as popular in this country as it is in England. J. W. W. Stephens (Lancet, March 5, 1904) recites the results of his experiments at Mian Mir, Punjab. He states that the commission of which he was a member became convinced that the fundamental measure in the antilarval crusade was drainage. The intensity of malaria, or as it has been called, the "endemic index" of a place, can be easily and accurately determined. It is necessary to examine a number of blood films, 25 is sufficient, taken from children under ten years of age dwelling in the district. This gives a percentage of those with parasites in their blood. Before the commencement of operations, all these conditions were accurately determined by a malarial survey. The importance of the introduction into sterilized regions, of *Anopheles* on carts, wagons and conveyances of various kinds, cannot be overestimated. It is discouraging to note that the report states that after two years of persistent work, as measured by the test of degree of improvement in the troops during the fever season, the outcome was *nil*. The conclusions of the commission in part were: First, that in quinine administration to the children and in abolition of infecting sources, one has the only means as yet devised for positively improving and safeguarding the health of the troops. In order that fundamental change, however, be made in the absolute well-being of camps situated in malarial districts, radical changes will probably be necessary in the entire system of irrigation and of water supply. For the time being, however, it is obviously necessary to depend simply upon quinine and segregation.

Some Observations on Kidney Cases.—H. Quincke (Deutsch. Arch. f. klin. Med., Vol. 79, Nos. 3 and 4) praises the action of potassium chlorate in cystitis, but urgently warns against its use where a pathological condition of the kidneys is suspected. In one case of congenital cystic kidney and in another of bilateral hydronephrosis, the drug hastened the fatal issue, though only four grams a day had been ordered. Since at one of the autopsies, an enlarged median lobe of the prostate was found, which had not been diagnosed during life, a sound with a lateral depression along its lower aspect near the tip was constructed, which is especially serviceable in such cases, since one can readily feel the depression pass over the lobe as the sound passes into the bladder, especially when the finger is inserted into the rectum. Attention is also drawn to a peculiar finding in the urine of a case of unilateral hydronephrosis; the sediment was rich in cells 24 to 36 mikra in diameter, with their entire cell-body filled with very coarse granules, disappearing after the addition of acetic acid. These elements were probably epithelial cells derived from the straight tubes altered by pressure; since they were subsequently found in similar cases; they are of diagnostic value and indicate that a slow atrophy is in progress. Fibrinuria is also occasionally observed here and in interstitial nephritis; the urine is often faintly alkaline and if allowed to stand, will deposit delicate filaments mixed with triple phosphate crystals.

Aortic Aneurism of Traumatic Origin.—Though by far the greater majority of aortic aneurisms have their origin in a syphilitic process within the walls of the artery, there is little room for doubt that trauma was the sole etiological factor in the case of A. Heller (Deutsch. Arch. f. klin. Med., Vol. 79, Nos. 3 and 4). A laborer was suddenly obliged to carry a very heavy weight, resulting in an acute dilatation of the beginning of the aorta with the tearing off of a portion of the wall. At the same time two aortic valves were torn, leading to an acute insufficiency with dilatation of the left ventricle. The resulting fall in pressure permitted the tear in the aorta to cover itself with intima, but the rest of the wall slowly developed into an aneurism. Microscopically the picture can be clearly differentiated from a specific process; in the one the elastic fibers of the media are everywhere pushed apart and torn, while in the other, a small-celled infiltration with giant-cells accompanied the nutrient vessels through the media and adventitia, while later portions of the media become necrotic.

Paroxysmal Hemoglobinuria Due to Cold.—In this peculiar form of hemoglobinuria, general exposure to cold or the mere immersion of a limb in cold water for a short period, will be followed by the discharge of a bloody urine. J. Donath (Zeitsch. f. klin. Med., Vol. 52, Nos. 1 and 2) removed some blood from the finger and placed it upon ice for a varying length of time, but could not detect any solution of hemoglobin, so that other factors besides cold must be at play. The blood was then actively shaken to determine if the corpuscles possess less resistance toward mechanical influences, but the difference from normal was so slight as to be unimportant. Simple ligation of an extremity sometimes gave rise to hemoglobinemia in the affected part, sometimes not. A number of other experiments did not lead to any very positive results, yet it seems likely that the entire process depends on a hemolytic action of the blood serum caused by the presence of serum hemolysins.

SURGERY.

The After-effects of Head Injuries.—There is no subject more rife with interest than this, because it touches upon the most vital part of man—the mind. T. C. English (Lancet, March 5, 1904), from an exhaustive study of the subject of traumatic epilepsy, late traumatic cerebral abscess and traumatic insanity concludes: (1) While some degree of mental impairment is comparatively common after injuries to the head, the changes are seldom sufficiently marked to be included under the heading of insanity. (2) Insanity may result from injury to any part of the head. (3) Traumatism leads to insanity in two ways, (*a*) direct insanity due to the actual injury to the brain or its membranes apart from hereditary or other predisposing causes; and (*b*) indirect insanity, that is to say, any form of insanity occurring as the result of lowered resistance of the brain due to injury in patients with a predisposition to insanity, hereditary or otherwise. (4) Every variety of mental change may be produced by traumatism, although some forms are commoner than others. (5) It is at present undetermined whether injury to the prefrontal region is more likely to be followed by mental disturbances than injury to other parts of the brain. (6) Only a small proportion of the cases of traumatic insanity are open to relief by operation, for a localizing indication in an accessible region must be present. (7) The results so far have been encouraging, and although the operation must necessarily be exploratory, it is fully justified in suitable cases, especially in face of the otherwise hopeless condition of these patients.

Oxygen Gas for Cystoscopy.—Carbolic, boracic and many other solutions have been used for this purpose, but all have more or less marked disadvantages. A. G. Faulds (Brit. Med. Jour., March, 1904) states that one of the advantages of using a solution instead of gas to distend the bladder is that the fluid dissem-

inates the heat and thus saves the mucous membrane from being injured. Unfortunately, however, it allows of the solution of blood and pus, which render the fields of vision obscure. Cold lamps, however, so called, are now fitted to cystoscopes, and these enable the operator to discard the fluid medium. It is well to distend a rubber bag, which contains the average amount expected of a urinary bladder with the oxygen and then slowly to force this through a tube into the bladder. The advantages of oxygen are obvious, particularly in the case of bleeding tumors or bleeding mucous membrane or purulent conditions. The oxygen undoubtedly has an ameliorating effect on any form of cystitis. It seems to give tone to the bladder wall and to purify the urine. If the cystitis should be marked, it may be necessary to use a local anesthetic. After removal of the cystoscope, the oxygen should be left in the bladder to exercise its disinfecting properties.

Lip Tie.—Cases of tongue-tie, while uncommon, are of sufficiently frequent occurrence to be well known. F. GRIFFITH (Ann. of Surg., March, 1904) states that a shortening of the frenum of the lips is not cited in literature. A case recently occurred in his practice which was so marked that the infant, a child of Italian parentage, presented this abnormality to such a remarkable degree that it necessitated operation. The midline of the entire upper lip had been bound to the gum by a fold of tissue continuous with the mucous lining of the mouth, one-eighth of an inch in thickness. The teeth were small but well formed. On opening the mouth, the middle of the upper lip rolled directly inward giving rise to a peculiar expression not apparent when in repose. The direct family history was negative. Treatment consisted in simple section of the frenum.

Penetrating Wounds of Abdomen.—Having positively determined that the wound has entered the abdominal cavity, there are two main questions to be considered, viz., Has any viscus been injured? Is hemorrhage taking place? Unfortunately there are no classic symptoms grouped about the penetration of stomach, intestines, spleen, liver or pancreas. Shock, it is true, subvenes sooner or later, but unfortunately in too many cases the first definite symptoms of perforation are those of the inflammatory reaction in the peritoneum which, when manifested, indicate, whatever the treatment, a lethal termination for the case. M. L. HARRIS (Ann. of Surg., March, 1904) states that the most important factors which have enabled surgery to produce a recovery percentage of over 90 per cent. instead of a mortality of 70 per cent., as was the rule under the old form of medical treatment, are, first, immediate operation, and second, drainage whenever the gastro-intestinal tract has been opened. After citing a large number of cases, upon which he had recently operated, the author emphasized the following points: (1) In penetrating wounds of the abdomen there are absolutely no known symptoms which indicate injury to any of the viscera except those noted above in connection with the urinary tract, stomach and occasionally the lower bowel. (2) Except those relating to general shock, all symptoms following such wounds indicate either internal hemorrhage or peritonitis. (3) To wait for symptoms of perforation of the intestines means to wait until peritonitis has developed, therefore (4) every bullet or stab wound which penetrates the abdominal cavity should be operated upon at the earliest possible moment, in order to anticipate the advent of peritonitis. (5) No time should be wasted in attempting to demonstrate the presence or absence of intestinal perforation by such means as the rectal insertion of gases or vapors, or the analysis of recollected intraperitoneally injected air or liquids. (6) It is essential to systematically examine the entire gastro-intestinal canal in all cases regardless of the point of entrance of the wounding body. (7) Whenever the alimentary canal has been perforated suitable drains should be placed either through the operative incisions or counter incisions, as may appear best suited to the individual case.

Surgery of Perforating Gastric Ulcer.—Thanks to the influence of Mr. Mayo Robson, the English physician is probably better prepared to diagnose this condition than his American colleague. This probably, rather than the belief held by some that the disease is more frequent in England than in the States, explains the divergence in the reported cases. William J. Mayo has done more than any other person in this country to impress upon one the frequency of gastric ulcer and the unimpeachable necessity of treating these cases by radical surgical procedure rather than by the temporization of medicine. ARCHIBALD MACLAREN (Ann. of Surg., March, 1904), in support of these statements cites the interesting facts that prior to the remarkable work of Lawson Tait, ectopic gestation was looked upon as a curiosity. Nowadays it is of very common occurrence; this simply because of the increased ability in diagnosis. Although the author believes ulcer to be as frequent in this country as abroad, he does not consider that perforation is at all as common. Out of Mayo's 313 operations on the stomach and the first portion of the duodenum, there were only five perforations. At the Massachusetts General Hospital, in 187 consecutive cases of gastric ulcer, there were but six perforations, all of which died. On the other hand, from 1897 to 1902, in 500 cases of gastric ulcers in the London Hospital, 48 died from peritonitis and perforation. Fenwick found that in 678 autopsies with open gastric ulcer, perforation had occurred in 23 per cent. Moynihan in the Lancet (January, 1903) reports 51 perforating duodenal ulcers, in most of which a mistaken diagnosis of appendicitis had been made. All authorities agree that whereas gastric ulcers are more common on the posterior wall, acute perforations are usually on the anterior surface. The posterior ulcers are of a chronic type and are apt to lead to subphrenic abscess. As is well known, the premonitory symptoms of gastric ulcer are usually well marked. In a certain proportion of cases, however, these may be absolutely lacking and it is interesting to note that this is the condition which exists typically in the ulcers of the anterior wall, which, as before noted, are of the acute perforating variety. The immediate symptoms of perforation are the agonizing, overwhelming pain which, as stated by Fenwick, often causes the patient to fall unconscious to the ground. Hart, of Philadelphia, is, in the opinion of the author, correct when he states that rigidity of the abdominal muscles is the keynote to the early recognition of peritoneal perforation from whatever source. The pain may subside, the temperature likewise, but the rigidity will continue to the end. Vomiting is seldom present with perforation. Subacute or chronic perforations do not present such typical symptoms. They are milder and slower in development, often giving the classic symptoms of a local peritonitis or of an intraperitoneal abscess located near the stomach. The obvious treatment of all these cases is first to give enough morphine to still the terrible pain and then, without delay, have the case removed to a hospital. Operation at the earliest possible moment is indicated, the mode of toilet of the peritoneum being determined by the amount of escaped contents. In every case the Fowler position should be used.

Operative Treatment of Habitual Subluxation of the Patella.—As is well known, this annoying lesion is most difficult to treat. The sesamoid duplicature of the patella tendon almost invariably dislocates outward,

the cause of this being probably a double one. First, because of the nature of the articular surfaces, and second, because of the moderate amount of knock knee which is always present in a varying degree. When the quadriceps contracts, the tendency is to throw the patella out, because the line of force is a triangular one. Ali Krogius (Zntrlbl. f. Chir., March 5, 1904) cites some of the methods which have been employed for the correction of the deformity. Bajardi has resected a portion out of the median line of the capsule. Le Dentu and Bardenhauer have adopted various methods of reducing the size of the capsule. Roux has transplanted the ligamentum patella. Lucas-Championnière and Pollard have endeavored to accomplish the same means by a deepening of the patella fossa. Heineke has transplanted the tuberosity of the tibia. Trendelenburg has endeavored to raise the outer condyle of the femur. Of all these methods, the capsule splitting of Le Dentu, either in its original form or in Kocher's modification, seems to have the widest range of use. In the case under consideration, there was no indication for bone operation, and because of the discouraging ease and persistency with which the patella was dislocated to the outer side, it did not seem as though the ordinary plastic operation of the soft parts would suffice. The method chosen was as follows: On the outer margin of the knee a curvilinear skin incision is made, similar to that employed by Kocher for resection of the knee. The flap is then carefully lifted from the center of the knee over the patella and also laterally, so that the whole front portion of the knee is exposed. Next a cut, one millimeter distant from the outer margin of the patella, is made. It begins a finger's breadth above the patella and ends opposite the tuberosity. This cut transfixes the iliotibial band over the lateral tendon of the vastus internus. The incision is then carried down through the tissue of the vastus internus, following so nearly as may be in the directions of the fibers of the muscle. About two fingers' breadth to the inner side of this a second incision is made parallel to the first in the lower portion, but diverging above. The flap is then raised and the defect repaired by catgut suture. This bridge-shaped strip is then carried across the patella and held in position on its outer margin with catgut sutures. The skin wound is then closed and the leg immobilized for three or four weeks. In particularly aggravated cases, this operation could be combined with the transplantation of the insertion of the ligamentum patella to the inner side. The results of this technic are good.

Renal Decapsulation for Unilateral Hematuria.—The old teaching that whenever hematuria was present, the cause was probably stone, tuberculosis or malignant growth in the kidney or papilloma of the bladder, has been somewhat upset by the impetus which has been given to investigation of this subject through the efforts to cure through decapsulation. Leonard Freeman (Ann. of Surg., March, 1904) states that tuberculosis is probably the most frequent cause of obscure renal bleeding. Next in frequency comes chronic nephritis, usually of the interstitial type and often attacking the glomeruli. It may be bilateral or unilateral. It may involve the entire kidney or appear in small portions of the organ only, which has often, no doubt, led to its non-recognition. Few physicians, the author states, seem to be aware that copious and prolonged hemorrhages may arise even when the disease is limited in extent. The precise manner in which decapsulation acts in these cases is not thoroughly understood. Inasmuch as other operations, particularly nephrotomy, acupuncture and even simple exposure of the kidney by lumbar incision have severally accomplished precisely what has justly been claimed for decapsulation, namely an entire relief of the symptoms, the profession is in the dark as to the precise mechanics of the improvement. Nephropexy has not been inconspicuous in giving relief from hematuria, and, while there are those who have asserted that nervous influence is the principal therapeutic feature in all these operations, Senator is convinced that it is a mere breaking up of adhesions or the fixation of a more or less movable organ which cures. Many have claimed that these good results, especially in a case of nephrotomy, were due to relief of the tension through division of the fibrous capsule. Others contend that the result is obtained by relief of congestion through the establishment of new blood vessels in the adhesions following operation. Operations for the relief of hematuria are still *sub judice*. It is therefore appropriate to relate the following case history: The patient was an Irishman, fifty-nine years old, anemic and emaciated. Twenty years ago he first noted blood in his urine. The hemorrhage was often profuse, the urine being opaque from blood and often thick with clots. For a year previous to the operation he had bled constantly and profusely, so that he had become all but exsanguinated. At various times during the illness pain was felt over the bladder, but none along the ureters or over the kidneys. There were at no time signs of uremia. Internal medication failed absolutely. Segregation showed the bleeding to come from the left kidney alone, the right side being normal. The hemoglobin per cent. was about thirty. The left kidney could not be palpated. No evidence as to the origin of the hemorrhage being detectable, a provisional diagnosis of chronic unilateral interstitial nephritis was made. At operation the kidney, which was normal in size, was shelled out of its adherent fatty capsule and decapsulated. The surface was granular and the fibrous capsule was also adherent. Considerable hemorrhage from the cortex occurred, which was with difficulty checked by prolonged pressure. Recovery was uneventful. The blood vanished from the urine, which became entirely clear within eighteen hours from the time of operation. During the ten weeks which had passed since decapsulation, there had been no signs of hematuria. Analysis shows it to be normal, a condition which had not existed for twenty years, because casts and albumin had been present in great quantities for an indefinite period prior to operation. A piece of the cortex, which was removed during operation showed advanced glomerulo-nephritis, and advanced arteriosclerosis. The author's conclusions are as follows: (1) The prominent cause of renal hematuria, which is often unilateral, is chronic interstitial nephritis, often involving the glomeruli. (2) This, together with other obscure causes must be excluded before a diagnosis of "essential hematuria" can be made. (3) Decapsulation of the kidney is indicated in these cases, as it offers a good prospect for cure of both the hematuria and the nephritis. Nephrectomy should be discarded on account of probable involvement of the other kidney.

THERAPEUTICS.

Improvements in Dietetic Diabetics.—Although many efforts have been made to improve upon the present method of treatment of diabetes, it must be confessed that the dietetic treatment is fundamentally the best at hand. James Sawyer (Brit. Med. Jour., March 5, 1904) states that it has long been recognized by the profession that the decrease in sugar and specific gravity in the urine are almost invariably marked by profound improvement in the general bodily conditions. It has therefore been the effort of many practitioners to make out dietary lists which shall be as little objectionable as possible. Until the researches of Mossé

were published two years ago, it had been the almost universal rule to withhold potato. The potato contains from 16 to 24 per cent. of starch. Mossé has concluded, however, that potatoes, far from being harmful, form a useful and beneficial food in glycosuria and that they are capable of being substituted for ordinary wheat bread in daily proportion sufficient to maintain the alimentary ratio. He found that a daily ingestion of two to three pounds of potatoes effected marked improvement in 19 out of 20 cases of diabetes. Singular to relate, they were instrumental in relieving the thirst. Possibly the potash, which is present in a large quantity in the potato in various combinations, is instrumental in making this tuber such a favorable article of diet. The author considers that the introduction of potato will prove to be the most important therapeutic advance made in late years in the treatment of diabetes. In order to preserve the potash and other salts, it is most essential that the potato should be cooked with its skin on. The author has prepared delicious baked cakes from a paste composed of a kind of flour prepared by rubbing down potatoes cooked with their coats on by steaming, blended with cream and butter. Bread and biscuits of a palatable kind can be made from bran and this potato flour. This seems so practical and useful a step that the details are welcome. They are as follows: Half pound of steamed potatoes, one-quarter pound bran, half an ounce of German yeast, half an ounce of butter, one egg. Twenty-four hours before making the dough, cook the potatoes by steaming them in their jackets, then peel and break up into flour with the fingers. Mix all the ingredients together and let the paste stand by the fire for an hour to rise. Bake for an hour and a half.

Treatment of Anchylostomiasis.—This disease has been shown to be so rife in many of the Southern States, that a consideration of its treatment is a desideratum for all. C. W. BRANCH (Brit. Med. Jour., March 5, 1904) states that it is by no means the experience of those who deal largely with *Anchylostoma*, that, as is stated by Prof. Stockman, they are readily killed by large doses of thymol. The author's routine is to give 30 grains of thymol in powder at 4, 6, 8 and 10 A.M. on an empty stomach followed by one ounce of castor oil at 6 P.M., that is, he uses 120 grains in the first treatment. Smaller doses are known by those who deal largely with this condition to be ineffectual. Even with these large doses, fully half the cases are not absolutely freed from the parasite. This dose of 120 grains of thymol may be given with absolute impunity, regardless of age. Children of three years take it without trouble. It should be noted that if, as is customary, these patients are coincidentally put on iron tonics, they will at once begin to improve with the disappearance of the anemia, whether or not the worms have entirely been cleared out of the intestinal tract. The practitioner must not be deceived by this improvement, which will be found to depend entirely upon the iron and which will cease after the worms begin reproducing in numbers, as they will, unless thoroughly killed and eradicated.

Treatment of Basedow's Disease.—The milk of goats deprived of their thyroid gland has given excellent results in Basedow's disease, but most patients cannot bear its prolonged use. As substitute, W. KUHNEMANN (Münch. med. Woch., March 8, 1904) recommends rodagen, a preparation obtained by precipitating the milk with alcohol. To insure himself that the improvement really came from the drug, the author ceased giving it, when the pulse-frequency again rose and the patient lost in body-weight.

Lumbar Puncture in Uremia.—The astonishing statement is made by A. SEIFFERT (Münch. med. Woch., March 8, 1904) that most cases of uremia complicating scarlet fever can be cured if treated by lumbar puncture. The technic is very simple: the patient is simply placed in the lateral position and punctured between the twelfth dorsal and the first lumbar vertebræ; as soon as the fluid appears, 5 to 30 grams are aspirated by means of a syringe. The initial and ofttime fatal convulsions of scarlet fever and measles also yield readily to lumbar puncture and a trial in purely renal conditions and in eclampsia is certainly indicated.

Influence of Dog Serum on Experimental Tuberculosis.—Despite the fact that the dog is exposed to tuberculosis more than most other animals, cases of infection are only rarely seen by veterinary surgeons, probably because some natural immune bodies are present in the serum. This observation has stimulated R. LINK (Deutsch. Arch. f. klin. Med., Vol. 79, Nos. 3 and 4) to try the effects of injections of dog serum upon rabbits experimentally inoculated with tuberculosis. In every case parallel experiments were made and the eye was generally selected for inoculation, as here the development of the lesions could be best observed. The results are rather discouraging since a favorable influence could not be absolutely proven, though in a few cases the disease seemed to run a milder course. The nodules on the iris occasionally showed a tendency to heal and at the post-mortem examination fewer tubercles were found in the organs, but an active immunization was never seen.

The Action of Organic Iodine.—The principal desiderata in iodine compounds for internal medication are: the presence of iodine in sufficient quantity to be productive of physiological effect, the absence of irritating properties, assimilability and the absence of other chemical compounds which might directly or remotely interfere with the action of the iodine. G. F. LYDSTON (Medicine, March, 1904) claims that these desiderata are all to be found in the organic preparation of iodine known as iodo-nucleoid. He found by experience that it was non-irritating and readily assimilated. It was less likely to produce iodism than the other salts of iodine, and being perfectly stable, could be administered in pill or powder form. While he is not prepared to state that it fills the rôle of iodide of potassium in every instance, he believes that in many cases which are intractable to the action of iodide of potash, excellent results are obtained from the iodo-nucleoid. Experiments were also made to determine whether more iodine could be retained in the body from the potassium iodide or from the iodo-nucleoid. It was found that 8 per cent. of iodine was retained from the potassium iodide, and 64 per cent. from the iodo-nucleoid.

Subcutaneous Feeding.—The subject of subcutaneous introduction of food has been a very unsatisfactory one, for hitherto only sterilized oil proved suitable. Kalodal, a proteid obtained from meat has been extensively tried by D. CREDÉ (Münch. med. Woch., March 1, 1904) and seems to be eminently suitable before and after operations in weakened individuals, since it can be sterilized and is not followed by pain or albuminuria. Instead of giving a plain infusion of saline solution the author now invariably adds five grams of kalodal in 500 grams of fluid, which he introduces under the skin at two different sites. This can be repeated every six hours, so that the patient receives twenty grams of albumin or 82 calorics subcutaneously every day. Since a cachectic individual requires only about 27 grams, the advantages are evident. If an attempt is made to concentrate the solution, small amounts of albumin will appear in the urine but the amount can be considerably increased by adding kalodal to nutritive enemas, as it is very rapidly absorbed from the rectum. The drug is on the market in sterile solution in glass tubes.

The Medical News.

A WEEKLY JOURNAL

OF MEDICAL SCIENCE.

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SATURDAY, APRIL 16, 1904.

INFANT MORTALITY AND FOUNDLING CARE.

Our editorial in the Medical News of March 26, "The Decrease of Foundling Mortality" has brought to us a number of requests for more definite information with regard to the possible increase of infant mortality in New York city in the families of those who after the death of their own child adopt foundlings. We are glad to find that there is so much interest in this important subject. We are sorry that we cannot give definite statistics in the matter, since as it is easy to understand, a special investigation over a wide field would have to be carried out in order to furnish them. The only data for our declarations in the matter are the opinions of physicians whose attention has been called to the subject by their experience in such families, but who are quite positive in their assertions that there is room for more than suspicion with regard to the high infant mortality that obtains.

It might seem utterly lacking in all faith in human nature to attempt to demonstrate that mothers should neglect their own children to such an extent as to cause an increased mortality among them simply for the purpose of being enabled thus to add to the family income by adopting a foundling. The investigations of several Parliamentary committees in England and, we believe, also of one public health department investigation in France, has shown, however, that whenever the life insurance of infants is allowed, infantile mortality increases among the insured. Not that there is actual direct doing to death of the children under these circumstances, but that there is a more or less unconscious neglect of a number of precautions necessary to maintain the child's health, and above all, when the child is suffering from serious illness a certain failure to supply that self-sacrificing devotion which is so necessary to preserve the life, particularly of a delicate child, when death threatens and only unceasing care can avail. Mothers probably do not quite realize what tempts them to be somewhat less careful of their children than they otherwise would be, but the temptation is there and the effect is to be seen in the mortality lists.

There is another phase of the question that seems worth calling to public attention at the same time. There is no doubt now that in the hands of midwives the infant mortality among new-born children in the foreign populations of New York city is appallingly high. It has been said over and over again that we cannot get along without the midwife, since many of our foreign born population will not employ regular male physicians and since, besides, there is often not sufficient money to pay properly for the services of a regular physician. The immense infant mortality that occurs under midwives' care might, it would seem, keep mothers from employing them as much as is now the case, for, after all, it is not a difficult matter in almost any part of New York city to secure through one of the many charitable organizations the services of a physician without charge.

One reason why this high mortality among children delivered by midwives seems not to deter many mothers from employing such help in labor is the feeling that even if their child does die there will be the compensation of having the opportunity to adopt a foundling, and thus add materially to the family income. After all, it must not be forgotten that $10 or $12 a month, when the only wage earner is obtaining less than $50 a month, is a very important addition to the means of a family. It is even more than might be the single $50 or $60 that would be obtained as insurance for a dead child. To some doctors it has even seemed that sufficiently long efforts were not made to resuscitate apparently dead still-born children, because of the fact that a dead-born child is not under these circumstances so

serious a misfortune as it is under ordinary conditions.

Such consideration may seem far-fetched, but human motives are wonderfully complex, and sociological studies serve only to show what apparently trivial factors may tend to swing the balance of human action along particular lines. It is with the idea of calling attention to this subject as a field for investigation on the part of the charitably inclined, who are at the same time interested in sociological problems, rather than definitely to accuse present conditions that we entered upon the discussion of this subject. We have no doubt at all that there is more in it than has usually been considered, and we would welcome contributions from physicians whose experience seems to show that present conditions in the decrease of foundling mortality are not so entirely without their compensating evils as has sometimes been thought. We may say that we expect to publish some articles dealing with this aspect of medical work among the poor of large cities before long.

"IN HOC SIGNO."

Not only by the precepts learned at our grandmother's knee, but by the teaching of our great medical authorities do most of us believe that a scarlatina patient who is "peeling," is a chap to be avoided. If this fond belief is to be torn up and taken from us, the sooner it is done the better.

That we are, the world over, agreed as to the danger of scarlatinal scales can be inferred from the following quotation from Osler:

"When desquamation begins, the child should be thoroughly rubbed every day or every second day with sweet oil or carbolated vaseline, or a five-per-cent. hydro-naphthol soap, which prevents the drying and the diffusion of scales." Holt—Diseases of Infancy and Childhood, states that: "Even the mildest cases should be isolated for four weeks, and all cases until desquamation is complete."

So thoroughly is this idea of the infectiousness of the scales engrafted upon the professional mind, that the picture of unfortunate adults who, failing to peel propitiously, have as a consequence been incarcerated for six or seven weeks, is not uncommon. There they sit in their solitary pens slowly and painfully grinding the refractory skin from their soles and from the palms of their hands with a block of pumice! It makes one think of Booth's memorable picture of Shylock whetting his knife upon his sole. If the undesirability of this enforced confinement is objectionable from the standpoint of expense to the community, how infinitely more is it so from that of offence against the individual! Grinding one's sole down with pumice stone seems to be more a desideratum for the complaining moralist than for the practitioner of medicine.

R. E. Lauder, Medical Superintendent of the Borough and Port Fever Hospital of Southampton, England, who has had a vast range of experience in the treatment of scarlet fever, states, in the *Lancet* of March 12, 1904, that as a result of careful observations and studies bearing upon the etiology of the so-called "return" cases, he became a year ago thoroughly convinced, theoretically at least, that he was working from a fallacious standpoint. He therefore determined to alter the entire policy of the hospital which bore on prophylaxis. Needless to say this had in the past been carried out under the assumption that desquamation was the prime factor in determining non-infectiousness of the convalescents.

The Southampton Isolation Hospital is a refuge not alone for the Port, but also for a broad territory in and about the city. So many patients who from a basis of "desquamation" had been discharged as absolutely harmless, had without any doubt infected others after their dismissal, that in this hospital, as well as in many others throughout the world, complaint was being freely made that the so-called "isolation" provided by them was not of sufficient value to compensate the public for the support of maintaining these institutions. If the conclusions reached purely as a result of these agitations result in the establishment of an entirely new basis of protection giving, it will at least show the value of adverse criticism. The new methods adopted are as follows: Before removal from the ambulance, each patient is carefully examined and undoubted cases of scarlatina are put into an "acute room," being kept there until the acute stage of the disease is passed and diphtheria has been excluded by bacteriological examination. At the end of the third week of the disease, if free from complications, patients are transferred from the general ward to another pavilion, which has been thoroughly disinfected. Here they are kept for one week, noses and throats being douched daily. At the end of this time, viz., in the fourth week of the disease, they are discharged from the hospital,

no matter what the condition of desquamation may be.

The tabulated forms show the following results: In 1892, 208 cases were removed to the hospital; 164 were discharged. Their average stay was forty-eight days. The number causing "return" cases was seven. In 1903, 353 cases were removed to the hospital; 325 were discharged; thirty-four days was the average stay, and the number causing "return" cases was seven. In other words, in 1902, the percentage causing "return" cases was 4.27. In 1903 it was 2.15. The percentage after forty-eight days' treatment was almost double that which followed thirty-four days' treatment.

Thus it appears that prolonged stay in the hospital and absence of desquamation do not assist in preventing "return" cases but actually seem to favor them. That the respiratory tract rather than the dry scales, which are thought by the author to be but the harmless products of toxic elements, is the responsible focus of infection is substantiated by the observation that evidences of infection often follow operation on the upper respiratory tract. Furthermore, constitutional symptoms and fever are as a rule proportionate to the condition of the respiratory passages and a great majority of return cases is associated with a history of contact with a convalescent suffering from upper respiratory discharges.

In view of the apparent difficulties hedged about the building of suitable isolation hospitals in this city, it may be interesting, if true, to note that this new basis of prophylaxis, if instituted, would increase the existing hospital facilities by about one-third.

CIRRHOSIS OF THE STOMACH.

It must now be admitted that the evidence upon which Andral, Cruveilhier, Brinton, Wilkes and others sought to establish differential points between diffuse carcinoma of the stomach and benign cirrhosis, was imperfect. Of late years the condition has been given abstract or more or less academic recognition, but no definite effort to base differential diagnosis of the two conditions in the light of modern gastric pathology has yet been brought to a focus. Osler recognizes the condition and reports a particularly characteristic state. Einhorn says that a benign cirrhosis does occur. Hemmeter writes that the pylorus may be the seat of a hypertrophic stenosis and that in rare instances the entire stomach may be involved in this process. German pathologists give little attention to the condition. The French pathologists, Bret and Caviot, maintain a negative attitude. Most Continental writers in general agree that the condition looked upon by the English-speaking pathologists as benign cirrhosis is in reality an evidence of low grade malignant change. This belief they base upon the fact that although no evidence of carcinoma is to be found in the wall of the stomach, the lymphatic glands draining the organ show signs of involvment.

The *Annals of Surgery*, March, 1904, contains a monograph by John G. Sheldon on the subject which is as rich in bibliographical details as it is in original suggestions. There are so many people wandering about the country, utter physical wrecks, traveling hopelessly from local practitioner to town practitioner, thence to the specialist of the neighboring city and finally to the well-known investigator of gastric lesions in some great University center, gaining nothing but hardship, losing hope and strength, a blight upon and a menace to the medical profession at large, that it is expedient to have all progress made in the rational treatment of these cases scattered as broadly as possible among the general practitioners of medicine. The case detailed by Sheldon went through exactly this itinerary, except that the final brilliant cure is repeated in but a small proportion.

Because of these facts; First, that such cases are common; second, that under medical treatment they obviously can obtain no relief; third, because of the just opprobrium which comes to the profession through its inability to cope with them, the details of Sheldon's case are well worthy of quoting.

The man under consideration was fifty-two years of age. He was perfectly well until fifteen years ago. From that time, his symptoms can be divided into four periods. For the first six years, he was troubled with sourness of the stomach, poor appetite, dull pain, belching of gas and a coated tongue. These symptoms slowly progressed. At the end of the sixth year he felt well only at short intervals. During the next four years, from his forty-fifth to his forty-ninth year, his symptoms gradually became more severe, but he continued to work on his farm. During these eleven years of suffering he had received no treatment. Neither had he taken medicine of any kind. During the last three years of his illness he was unable to work on account of weakness and suffering. Abdominal pain was nearly

always present. It was sometimes dull and gnawing, at other times the paroxysms were so severe as to require morphine. The pain was always in the median line of the abdomen above the umbilicus. It was never located in a small area and never radiated. Ingestion of solids or liquids increased its severity. Vomiting sometimes gave partial relief. Next to pain, it was his most distressing symptom. Sometimes it occurred immediately after eating, sometimes not before two or three hours. He often vomited food that he had eaten forty-eight hours before. His appetite was always good till the last year of his illness.

In one of the great eastern cities, a diagnosis of gastric ulcer was made and rectal feeding resorted to for three weeks. During this time he improved. On returning home, he began to eat and the old symptoms returned.

Physical examination was negative. Laboratory examination showed the gastric contents to yield no hydrochloric acid. The red cells were 2,800,000, the hemoglobin 48 per cent. Inflation of the stomach was puzzling. Its outline could not be determined by external examination. On operation, the stomach wall was found to be at least one centimeter in thickness. It cut with resistance and the cut surface looked like fibrous tissue. The gastric mucosa was smooth and atrophic. A Murphy button was used to perform gastro-enterostomy.

Three months after the operation this patient had gained 36 pounds. Enough time has now elapsed to positively exclude the presence of malignant growth, no evidence of which could be found at the time of operation. There is therefore no other alternative than to believe the lesion to have been a benign cirrhosis.

The etiology of this condition is only vaguely known, because not more than ten cases have been recorded with any degree of definiteness. The average age is about fifty years. Men and women are equally affected. Alcohol does not seem to play an important part in the causation of the disease. Ordinarily it is unassociated with other diseased conditions, cicatricial changes in the liver, spleen or kidneys not having been mentioned in any case. The symptoms have in general been those of long standing and obstinate dyspepsia. Physical examination was found negative in all but one case. In this instance a movable tumor was discovered in the region of the stomach which proved to be a conglomeration of non-malignant tissue due to trauma.

Sheldon concludes that the following conditions would point to the diagnosis of gastric cirrhosis: (1) Long standing disease (2) absence of vomiting of blood; (3) a contracted stomach; (4) absence of a tumor on palpation; (5) absence of glandular or hepatic involvement; (6) improvement of the patient generally and relief of the stomach symptoms for a considerable period of time when rectal feeding is resorted to. Obviously the treatment indicated is gastro-enterostomy.

ECHOES AND NEWS.

NEW YORK.

New York Academy of Medicine.—The Section on Medicine will hold a meeting Tuesday evening, April 19, at 8:15 o'clock. Following is the program: I. Presentation of Cases. II. Clinical Reports: (1) Tabes with Early Appearance of Charcot Joint, with exhibition of patient, by W. B. Noyes, M.D.; (2) Myxedema, with exhibition of patient, by H. S. Patterson, M.D.; (3) Typhoid Fever with Repeated Chills, by John Howland, M.D. III. Papers: (1) The Isle of Man as a Climatic Station, by James K. Crook, M.D.; (2) Who is Underfed? by Heinrich Stern, M.D.

Health Department Appointment.—Dr. John A. McCorkle, of Brooklyn, was chosen last week by Health Commissioner Darlington as a member of the advisory board to the Health Department. The position is honorary.

Dr. Lederle's New Venture.—Dr. Ernst J. Lederle, Health Commisisoner in Mayor Low's administration, has established a laboratory for sanitary, chemical, and bacteriological investigations. Associated with him are Joseph A. Deghuee, Ph.D., and R. C. W. Wadsworth, his secretary while health commissioner.

Reception to Dr. Paul Ehrlich.—Last Saturday a reception was given to Dr. Paul Ehrlich by Dr. S. J. Meltzer, which was attended by a large number of distinguished scientists from New York, Boston, Philadelphia, Chicago, Montreal and other cities. Coming at the close of the session of the Association of Pathologists and Bacteriologists, many members of this body, coming from over the entire United States, were present. This gave the gathering a particularly cosmopolitan aspect.

Home for Incurables.—The will of Julie F. H. Nevins, filed last week in the Surrogate's Court, leaves $1,000,000 to build and maintain a home for the aged. The proposed institution is to be known as the "Henry Coffin Nevins Home." The trustees are the Central Realty Bond and Trust Company, Smith Mason, and Miss Ida Mason, Joseph Neuscheler, and Charles Strauss. Mr. Strauss said that no definite steps had yet been taken toward carrying out Mrs. Nevin's plans. It would take some time to get the trust into shape, and meantime the trustees were considering sites. He could not say whether the home would be established within the city limits or in the country. It will accommodate 100 persons.

Hospital Appointments.—The following men at the College of Physicians and Surgeons received appointments during the past week as follows: Lying-in, C. T. Stevens; R. N. Prentiss, M.D., 3rd year; M. D. Thomas; C. E. McNenney. The S. R. Smith Infirmary, C. A. Holmes. The J. Hood Wright,

R. H. Breed; H. N. Moeller; W. C. Bartrum. Paterson General, E. D. Royall. Roosevelt, A. M. Clark; B. W. Paddock; F. D. H. Coerr; J. C. Dingman; T. L. Saunders; J. S. Thomas; A. Van der Veer, Jr.; P. H. Ringer. New York, 1st, Edward Cussler; James Greenway; W. Gillespie, M.D., P. & S., 1903; H. W. Lathrop; W. F. Burrows.

Resolutions on the Death of Dr. John Metcalfe Polk.—At a special meeting of the Class of 1899 of the Cornell University Medical College, held April 4, 1904, the following resolutions were unanimously adopted:

Whereas, we have learned with deep regret of the death of our classmate, John Metcalfe Polk, M.D.;

Resolved, that in the death of Dr. Polk the class of 1899 loses one of its most promising members, and that the medical profession is deprived of one whose career opened with unusual brilliancy.

Resolved, that we tender to the family of our late fellow-student our heart-felt sympathy in their great bereavement.

Resolved, that a copy of these resolutions be forwarded to the family of our deceased classmate, and that they be sent for publication to the medical journals of this city and to the *Cornell Alumni News.* Frederick L. Keays, R. J. E. Scott, William J. Jones, *Committee.*

Basilar Meningitis.—There have been a number of cases of acute cerebrospinal meningitis in this city during the past month and some have gone so far as to declare it an epidemic which is, however, at the present writing far from the truth. At the Health Department on April 8th it was said that, while the number of cases of meningitis did not warrant the statement that it is epidemic among children, there has been a marked increase in the number of cases, many of which have proved fatal. For the week ending April 2, there were 31 deaths reported for this disease, and for the week previous, 26. By far the greater number are in Manhattan, and the deaths for a month in that borough indicate how rapidly the disease has spread. During the first week in March there were 6 deaths, in the second 13, in the third 10, and in the fourth 24.

The Alumni Association of St. Luke's Hospital.—On April 8, 1904, this society held a meeting. A paper on radium was presented by Dr. Robert Abbe, who also showed specimens of radium obtained from the Curies in Paris and from Germany, and demonstrated the Piffard ultraviolet light. The Austrians have cornered the market on radium and the Curies have no more for sale, but Dr. Abbe showed the plates of experiments by which he was able to prove that the Austrian product of 1,000,000 strength was not so strong as the Curies' 300,000 specimen. That the luminosity is no indication of the chemical activity was also well shown by a series of plates. Many experiments have been made by the speaker, and he has found that *Amœbæ* and other protozoa are much affected by the rays, that ant larvæ, though not killed, were prevented from developing, and, as had been shown by others, that moth larvæ failed to develop into adult moths, but continued to live an exceptional length of time as larvæ. Bacteria are very little affected. Dr. Abbe has used radium in a number of cases of lupus and epithelioma of the face and jaw, and cancer of the breast. He was able to report remarkable success in several of these, and showed photographs and casts taken at regular intervals. One noteworthy case was an epithelioma of the lower jaw, another was a recurrent cancer involving the whole left breast. In the latter case, casts and photographs were made every six weeks, and they graphically showed the marvellous and progressive dwindling of the neoplastic tissue. He was not able to say that the radium emanations would penetrate far into the tissues, for he had found that the insertion of radium beneath the skin of a rabbit had absolutely no effect, while the same radium placed on the skin would cause a dermatitis. In the treatment of superficial new growths, he would place the knife first, then the X-rays, and after that, radium.

Dr. Charles T. Dade said that at the skin department of the Vanderbilt Clinic the use of radium had been abandoned. In epithelioma of the face it had no effect on the pearly border, and a curetted area healed more rapidly than another area exposed a great many times to radium. It had also failed in lupus vulgaris and in lupus erythematosus.

Dr. F. S. Meara spoke of the remarkable similarity of the phenomena produced by two entirely different physical forces, the X-ray being a species of ether waves, while the radium effect is produced by actual particles of the radium which are hurled into space. They are much smaller than atoms and theoretically can pass through the human body with ease.

Dr. J. E. Traub reported some experiments done with Dr. Sinclair Tousey with radio-active solutions. Some of these have already been reported by Dr. Tousey. A dog given radio-active saline infusions intravenously showed no change in general health or in blood pressure. Fluorescein solutions placed in the stomach gave a very clear picture of the borders of the organ when an electric lamp was inserted. In making radio-active solutions an open tube must be employed.

The Cat Nuisance.—In view of the proposed changes regarding the licensing of certain domestic animals in this city it may be well to speak a word as to the need for such legislation. Nearly everyone has had something to say upon the question of allowing dogs in the streets and public buildings, but cats have so far escaped the attention that is certainly their due. Through our dog muzzling ordinances we have succeeded in enlisting the strong arm of the law against disease, as it is transferred from the canine to the human species in the form of hydrophobia; but attention is now called to the fact that cats also are sometimes a source of conveyance of specific microorganisms. Although this may be a rather rare circumstance its possibility must be admitted by all, and the reporter happens to know of two cases where diphtheria was carried from one house to another by an immune feline whose responsibility was directly and absolutely proven when it was too late to save the child to whom the bacilli were thus conveyed. There is, however, one phase of the question which though not immediately dangerous to public health is certainly very annoying, and that is the various maneuvers which these animals go through in securing for themselves the removal of waste products of metabolism and in carrying on the reproductive function. This matter has been for some time a favorite subject for non-pet-loving individuals in their letters to the daily press, but nothing has come of it save a harmless bit of humor now and then, and the satisfaction that "constant reader" derives from seeing his philanthropic and finer thoughts in print. There is certainly enough proof of this condition of things even for the most bigoted anti-vivisection or anti-ordinance devotee; for it is only necessary to stroll about the walks, particularly those in the vicinity of the parks, to obtain evidence that must be convincing. Just at

present, however, one's attention is being strongly directed to the night orgies of promiscuous bands of cats in the neighborhood of his bedroom window. It would seem that the oft-quoted bit of verse, "in the spring a young man's fancy, etc.," is most reprehensibly applicable to the feline species at this season; at any rate, one who cannot sleep during the day is to be wofully pitied. The yowlings of these "pets" probably simulate a human cry more closely than the outcries of any other animal, and when constantly keyed up to the highest pitch from 10 P.M. until 4 A.M. life becomes indeed a responsible thing. Now the law recognizes the right of every citizen to as much calm and repose as he can possibly find in a great city, and it also recognizes that he may and can have grievances against unnecessary nuisances, both public and private. To be sure there are the flat-wheeled car and the old clothes man and the street gamin with his terrifying whistle, but these are noises heard mostly during the day and are in a measure unavoidable in our cosmopolitan life; in any case one can become accustomed to them in time through what the psychologists call a "laudable deafness," or something of the sort. But can one ever become accustomed to the nerve-torturing howls of a cat, to say nothing of a half dozen cats all vociferating at once? Perhaps so, but never as long as his sensorium remains in normal condition. The reporter would enjoy bringing to justice the person who first imported cats in New York city, no matter how praiseworthy his purpose, and it is not difficult to see how Dante would have pictured such a one in the Inferno. One rarely sees mice where cats abound. Perhaps the rodents are frightened away by the soul-piercing mewlings; certainly nobody has ever reported the killing of a mouse by a cat of the New York variety. To sum up, then, there is no reason for the existence of cats in this city, and if it can be proven that they serve any purpose whatever, useful or ornamental, there is still no reason why they should enjoy absolute lack of restraint, day or night, and absolutely no reason for their monopoly in setting in motion waves of unknown amplitude and greater possible vibration.

PHILADELPHIA.

Dr. Faure Entertained.—A reception and luncheon were tendered at the Woman's Hospital, April 8, to Dr. J. L. Faure, a distinguished French surgeon, and Dr. Howard A. Kelly, of Baltimore. Dr. Faure is visiting many institutions of this country in an investigation of American surgical methods. In a short address he spoke very highly of the proficiency of women physicians in this country and deplored the fact that no such opportunities for the study of medicine were afforded the women of France.

Typhoid Record Broken.—During the past week the new cases of typhoid fever numbered 389, the largest number reported in seven days in the history of the city. Deaths were twenty. Health officials are of the opinion that the epidemic has reached its height and will from this time on decline unless new freshets again stir up the Schuylkill. The only remedy offered is to boil the water.

Pasteur Institute Needed.—City Veterinarian Hartman, while discussing the recent large number of bites by dogs, affirmed that one of Philadelphia's most urgent needs is an institute for the treatment of persons who have been bitten by rabid dogs. He asserts that the Pasteur method could be carried out by the Board of Health at comparatively little cost. A hospital is not needed, simply a place for the manufacture and application of the virus.

Individual Communion Cups.—Dr. Howard S. Anders, in an open letter to the *Ledger*, comments very pertinently on the recent action of Bishop Fowler in refusing to administer the memorial of the Lord's Supper at a conference because individual communion cups had been provided. He states that the general principles of cleanliness, sanitary safety and delicate consideration for others are now so generally in use that it is unusual to meet with such petty and untimely objections. Since the inception of the reform "it has won its way, quietly, educationally, more and more widely among the congregations of various churches of the principal denominations, from a mere handful of about a score in 1894 to over 2,000 in the United States alone at the present time. This shows that the innovation has come to stay; that the people are deciding in favor of it; that sensible pastors sanction it; that the authority of bishops cannot retard it. Nearly every week a church somewhere adopts the individual communion cup method of administering the wine for the first time; and no church reverts to the single cup again."

A Case of Galactocele.—A case of this uncommon condition was reported at the Philadelphia Academy of Surgery, April 4, by Dr. W. W. Keen. He stated that he had amputated the breast at least 500 times and had seen from 300 to 500 more cases that did not require operation; among them all this was the only case of galactocele. The patient was a colored woman of twenty-one years who was married at the age of eighteen years. She had had one miscarriage and was later delivered of a full-term child which is now nine months old. She states that she noticed a small lump in her left breast when she was twelve or thirteen years old; this began to increase in size when she was three months pregnant. At the time of operation one-half of the breast was involved. The entire breast was removed, this being considered the proper treatment for such cases. Examination of the specimen showed it to contain one large and many small cysts that were filled with milk of an almost semisolid consistency. Microscopic sections revealed the presence of a conspicuous round-cell infiltration of the mammary tissue that justified the diagnosis of acute non-suppurative interstitial mastitis in addition to that of galactocele.

CHICAGO.

To Wage War on Tuberculosis.—Dr. Geo. W. Webster, President of the Illinois State Board of Health, recently addressed the Progressive Health Club on tuberculosis, and among other things he said: "I have with me a set of statistical tables just completed by the State Board of Health, showing that the number of deaths in Illinois from consumption during the year 1903 was 7,026, while pneumonia claimed nearly as many, 6,830. The greatest source of infection from consumption is through the medium of the sputum, and if the sputum of every consumptive could be destroyed, the disease could be banished from the face of the earth. Experience has shown consumption is a preventable disease, and in 70 per cent. of the cases, a curable one, if taken in time. What is needed in every State in the Union is a sanatorium for the treatment of consumptives. The stamping out of this dread disease is a matter for education and evolution. It depends upon right living, cleanliness, sunlight, temperance, good food, fresh air, and proper care."

Dangers of May Moving.—Physicians in this city during the last three or four years have been investigating a phase of the house-cleaning situation which ought to be more generally understood. It has been discovered in a great number of instances that a thor-

ough cleaning, disturbing, as it does, in many cases the accumulated dust and dormant germs of years, is followed almost immediately by the development of sickness in the family, undoubtedly brought about by the new activity of these germs. Physicians are cautioning their friends at this season of the year, either if they are moving into new apartments or continuing in their old ones, to see that a thorough fumigation of every room goes on, in addition to the cleaning, before the home is occupied. The wisdom of this course, particularly when a family moves into a flat previously occupied by people whose physical condition and surroundings are utterly unknown, is apparent at the first glance. There is a movement now on foot among some of the leading medical men of the city for the preparation of an ordinance that shall make it compulsory on the part of a landlord to thoroughly fumigate a vacated apartment to the satisfaction of the Health Commissioner before it is offered for rent to a new comer.

First Aid Instruction to Employees.—The management of the Pennsylvania System has decided to instruct all the employees of the operating department in rendering first aid to the injured. The plan will soon be put into effect on the lines in the East and West, thereby covering the entire system. The plan is comprehensive, and includes equipping all baggage, mail, express, working and wrecking cars, terminals, yards, offices, shops and important stations with stretchers. The so-called first aid boxes will also be provided in all locomotives, terminals, yard offices, shops and stations. These boxes will contain six sterilized first aid packages. Each package contains one large triangular bandage, one ordinary roller bandage, two compresses and two safety pins. No drugs or liquors will be provided. The boxes will be of wood, and will contain a tin box, in which the materials will be confined. The Pennsylvania is also perfecting plans for the construction of several hospital cars adapted for the transportation of the sick, and to be used in emergency cases.

Establishment of Antitoxin Stations.—Thirty-six diphtheria antitoxin stations have been established in various localities throughout the city, at which physicians may obtain antitoxin free for indigent patients, and at low rates for those able to pay. Culture outfits may also be obtained at these stations.

Resignation of Dr. Kreider.—Dr. Geo. N. Kreider, of Springfield, Ill., Major and Surgeon, assigned to the Fifth Infantry of the Illinois National Guard, has resigned, and Dr. Arthur F. Wilhelmj, of Decatur, has been designated to fill the vacancy on the examining board of the regiment, caused by the resignation of Dr. Kreider.

The Influence of Alcohol, Ether and Chloroform on Natural Immunity in its Relation to Leucocytosis and Phagocytosis.—Dr. Geo. Rubin presented a paper on this subject before the March meeting of the Chicago Pathological Society. He divided his work in three series, namely, alcohol, ether and chloroform. He found that all of these narcotics lower the resistance of rabbits to infection, and that it makes no difference how the narcotic is administered, hypodermically or by inhalation, so that the necessary amount is absorbed to produce complete narcosis. The author found that in the rabbits narcotized and infected, the leucocytosis was considerably lessened, and the animals often succumbed to the infection, while the controls had marked leucocytosis and recovered. In those cases where both rabbits died, the control usually survived his narcotized fellow for a considerable period of time. In certain cases the discrepancies in the leucocyte counts were not sufficient to account for the recovery of the control rabbit and the death of the other. So he reasoned from that, that the narcotics may have an unfavorable effect on the functions of the phagocytes. To test that presumption the author carried out several experiments which were as follows: Two rabbits were injected intraperitoneally with an emulsion of carmine, one having been previously narcotized. He found that a greater number of phagocytes took up carmine granules in the control rabbit than in the one that was narcotized. He also demonstrated a negative chemotaxis between alcohol and the leucocytes. He inserted two capillary tubes, one filled with alcohol, the other with bouillon, under the skin in rabbit's ear; when withdrawn twenty-four hours hence, he found that the bouillon tube was filled with leucocytes, while the alcohol tube was empty. The author gives tables of leucocyte counts made from the blood of 60 drunkards, which show a marked reduction in their number. Differential counts in 25 cases show no deviation from the normal ratio. He found also a considerable difference in the number of leucocytes in the steady and periodical drinker. The latter has more leucocytes than the former. He tries to explain this phenomenon in two ways: (1) That the alcohol may have a detrimental effect on the leucocytogenic centers, so that the tissues in the periodical drunkard have a chance to recuperate between the periods of intoxication, while in the steady drinker, the tissues being constantly under the influence of the alcohol cannot produce the normal number of leucocytes. (2) The negative chemotaxis prevents the white blood corpuscles from entering the circulation in as large numbers where there is alcohol constantly present in the system, while in the periodical drunkard the toxic agent is, at times, entirely eliminated. He draws the following conclusions from his work: (1) That alcohol, ether and chloroform have a decidedly detrimental influence on the natural defence against infection, and that this lowering or suspension of the resisting power of the animal is not due to any organic lesions, since no changes in any of the vital organs were discoverable in any of the animals except such as were caused by the infectious material employed. (2) The influence of the narcotics appear to affect directly the substance or substances which inhibit the growth and toxic action of bacteria in the normal animal; and that these substances are either the leucocytes themselves or something derived from them. (3) The period of detrimental action of the narcotic depends largely on the amount administered, the depth of narcosis, and upon the rapidity of its elimination from the system.

When to Operate and When Not to Operate on the Mastoid Bone.—At the March meeting of the Chicago Laryngological and Climatological Society, Dr. Henry Gradle, in a paper on this subject, said that the operative exposure of the cells within the mastoid process is at present fully recognized as a life-saving operation. The literature of the last decade yields annually reports of some hundreds of cases of intracranial complications and of pyemia or otitic origin. Of these cases, inevitably doomed without operation, a variable, but large, proportion is saved surgically. The review of these reports teaches, first, that suppuration of the middle ear, both acute or chronic, involves danger to life. Secondly, that even in the desperate cases thus reported greater success attends mastoid operations, although many of them must extend into the cranial cavity, and, thirdly, that properly timed surgical intervention would have prevented this serious extension of the disease. But on the other hand, it was known that acute mastoiditis gets well in most instances, and kills in very few without operation. While chronic mastoid disease ends perhaps but rarely in recovery without operation, it can and does remain sta-

tionary and unprogressive in the preponderance of patients. There are no reliable statistics regarding the fatality of suppuration of the middle ear and of the antrum not treated by operation. The figures of clinics are not decisive, because they contain a selection of the graver cases. As far as he can estimate from personal experience and available reports published, the fatality of all otitic suppuration, acute and chronic, is in the neighborhood of one-half per cent. The danger is greatest during the exacerbations of chronic suppurations of the middle ear. The mortality of simple opening of the mastoid process fluctuates in recent reports between four per cent. and nearly zero. The radical mastoid operation is generally attended by about eight per cent. mortality. In the statistics of the Illinois Eye and Ear Infirmary for five years of the work done by all attending surgeons, kindly furnished him by Dr. Pierce, 26 simple operations (opening into the mastoid) resulted in two deaths, while in 126 radical operations there were 12 fatalities. He said the indications for opening the mastoid for acute disease can be best defined on the basis of a brief review of the various modes of termination of acute mastoiditis. In at least one-third of all instances acute mastoiditis subsides gradually after a climax of three or four days, provided there is free drainage from the middle ear.

Operative Indications.—(1) The least suspicion of intracranial extension based on persistent one-sided headache or on any cerebral symptoms gives an immediate vital indication. (2) Whenever a perforation threatens, this should be anticipated by operation, and if it has opened spontaneously, through a narrow fistula, the danger of pus under tension should be obviated by better drainage. Perforation is inevitable whenever the posterior wall of the meatus of the ear begins to sag, whenever the soft tissues behind the ear show inflammatory infiltration (not merely a pale edema), or when infiltration begins around and beneath the tip of the mastoid. (3) When the characteristic signs of mastoiditis, namely, pain and tenderness, continue to increase after the third day, or even increase rapidly after the second day, immediate operation is the safest course. (4) When the discharge of acute otitis with mastoid symptoms does not diminish at all in the course of about two weeks of appropriate treatment, chronicity must be expected, even though the mastoid signs diminish. Hence, an operation is now proper. (5) If the mastoid pain and tenderness begin to diminish after two or three days of climax, the operation may be deferred. Those cases in which the mastoid symptoms remain stationary after the first two or three days belong to the debatable class in which it is difficult to say whether to operate or to wait. If mastoiditis follows otitis, the discharge of which has ceased, the need of operation is greater than when there is still discharge from the middle ear. Streptococcus infection means greater danger and more need of operation than the presence of the pneumococcus or staphylococcus in the pus of the middle ear. In cases of doubt an unnecessary operation may be safer than any unreasonable delay. In all acute cases the only operation to be considered is the opening of the mastoid. The radical operation is entirely uncalled-for and improper. In chronic disease of the middle ear and mastoid, the operative indications are to be regarded from a different point of view from those in acute cases. A simple opening of the mastoid antrum, although often curative, is generally not the proper operation. In most cases a cure is obtained quicker and with greater certainty by the radical operation, which converts the antrum, the attic and the middle ear proper into one continuous and accessible space with exenteration of contents. Perhaps the most convenient way of defining the operative indications in chronic disease of the middle ear is to eliminate those cases which do not require operation. It is not proper to resort to operation in the absence of any urgent symptom, until a thorough trial has been given to non-operative treatment. Only after chronic otitic suppuration without urgent symptoms has resisted all conservative methods or has relaxed repeatedly in spite of apparent cure, should the radical operation be considered. If, after such treatment has been properly tested for a sufficient length of time, there remains a discharge free from odor, danger to the patient is not greater and probably less from the disease than from the radical operation. If, however, the discharge remains fetid in odor, experience shows that the danger from the disease is as great, if not greater, than from the operation, while the latter offers at least complete exemption from future danger, if not the certainty of a cure. Hence, under these conditions and in the absence of threatening symptoms, the question whether to operate or not must be decided by the patient himself, or at least by his circumstances. A prompt radical operation is the only safe course in all instances in which irritative symptoms indicate active extension of the disease. This immediate indication is given in all chronic instances of otitic suppuration by persistent dizziness, pain or local tenderness, one-sided headache, or any symptoms suspicious of intracranial involvement.

GENERAL.

Vital Statistics on the Stage.—Ludovic Barnay, the famous Hungarian actor who once delighted New York theatre-goers nearly two decades ago in "Julius Cæsar," says that he has played 3,868 times in 98 cities. He has appeared in 371 pieces and assumed 455 rôles. On the stage he has been married 1,721 times and died 1,120 times. "I was stabbed," he says in his memoirs, "61 times, killed by lightning 51 times, drowned 22 times, poisoned 166 times, beaten to death 86 times, died of heart disease 192 times, assassinated 109 and executed 133 times. Finally I committed suicide 314 and died a natural death 55 times." All of which shows that the pabulum of dramatic material is chiefly composed of murder, lust, violence and other beatific passions. Fancy a drama purged of this element and dealing with angel cake and sermons and you would have the drama of those who wish to deodorize their neighbors and fail to comply with board of health rules in their own back yard.

Gift for Yale Medical School.—The legacies of the late Mrs. Henry Farnam to Yale have been somewhat incorrectly reported. About $52,500 will go to the endowment fund of the Medical School, and about $39,000 to the endowment fund of the university library, the income to be used in the purchase of books. These additions raise the total funds of the Medical School to about $161,000 and of the library to about $369,000. Mrs. Farnam had been a steady and generous giver to various branches of the university, and her gifts enumerated during the last ten years in the treasurer's report amount to more than $20,000.

A Useful Departure.—Henry Phipps, of the United States Steel Corporation, has offered to the Prison Board of the Western Penitentiary a large floral conservatory for the penitentiary, provided the prisoners be permitted to visit the greenhouse. The prison board has accepted the offer. Plans are being made for a large conservatory of concrete, slate, steel and glass to be erected adjoining the prison. The greenhouse will be so arranged that when the

prisoners are not visiting the place it can be thrown open to the public.

The Medical Profession.—In a recent article in the *Medical Library and Historical Journal*, Dr. J. P. Warbasse, of Brooklyn, with other excellent thoughts writes as follows: Hand in hand with the march of civilization have gone the advancements in medicine. To-day the practitioner in medicine lives closest to the lives of the people. No other vocation brings men so close to the home. The clergyman knows people at their best; the lawyer knows them at their worst; the doctor knows them as they are. And yet the doctor is the most misunderstood of men. He strives to inhibit the very conditions from which he gains his livelihood. He conducts societies for the preservation of the public health; he strives for the prevention of diseases; he works to perfect means for shortening the duration of diseases; and, finally, he disseminates his knowledge of these things to all lands. He gives his knowledge to all the world and claims no proprietorship in anything which his colleague may use for the benefit of humanity. He patents nothing. Medical societies have opened their libraries to the public, from which the layman may learn to take care of his health and his family's. The physicians of the world are united into local societies, into national organizations, and finally into international congresses which meet and cooperate for these ends. No reputable physician has any medical information which his brother physician may not have freely for the asking. Are the lawyers of the world banded together to disseminate knowledge for the prevention of litigation? Have the tailors united in an effort to secure greater permanence in styles? Did Sheffield invite Pittsburg to a conference to teach her the secrets of steel? No: these are businesses. The layman is engaged in business and cannot understand these things.

The physician is misunderstood by the lawyer because, on account of these very things, the lawyer looks upon him as a poor business man. The public does not see that philanthropy has any place in business. None but a doctor can judge a doctor. The layman's judgment as to who is the most capable physician is apt to be wrong, for the reason that he measures by standards which we do not recognize. If the layman were wise he would employ a physician to advise him whom to employ to treat him.

As civilization and the mental development of the race have their erratic deviations, so are there kindred erratic exhibitions of medicine. As there are Anarchists and Dowieites, Socialists and Spiritualists, so are there Eddyites and Homeopaths, Osteopaths and Healers. These are not backward steps; they are the products of a higher civilization. The time is not yet when the truth shall reign supreme and alone. There are the lie and the imposition and the bombastic pretense to peck at its heels and pick at the hem of its garment. These come and go. History has witnessed the beginning and the end of thousands of them. They are fungi that have their origin from things of virile life, but they have not the capacity to endure.

While these fads and sects seem to interfere with the progress of medicine, the contrary is really the case. Medicine takes from them the thing that has made them live, and eventually appropriates it to herself. It may be laid down as an axiom that anything which has the power of developing a sect or following must have something good in it. Medicine is an art, because it appropriates the best wherever it can find it and calls it its own. Its mission is to make the human body more enduring and beautiful, to surround it with wholesomeness, to make the senses more perfect and the hand more cunning; and that is a mission which must needs make for the uplifting of the spirit.

Because the physician is engaged in these things, he too is made better. He is uplifted by his own efforts to help others. He shares in the civilizing effect of his own work.

OBITUARY.

Dr. Philip Bissell died from pneumonia last week at the New York Hospital, where he had just completed his interneship. He was born in Rochester, N. Y., twenty-seven years ago and was a son of Willard Bissell, a merchant of that city. He was a graduate of Columbia University, and was a student of marked ability. Dr. Bissel is the fifth or sixth young physician of unusual promise to succumb in the opening year of their career in New York this past year.

Dr. Crawford K. Fritts, the leading physician of Hudson, N. Y., died last week. He had an attack of neuralgia of the heart, and despite heroic methods pursued by his attending physicians, he failed to recover. He was in his fifty-fourth year.

CORRESPONDENCE.

THE TOXICITY OF THE SAPONINS.

To the Editor of the Medical News:

Dear Sir: Out of hand it would be difficult to establish a relationship between hemolysis and the soda water fountain, but in a recent and interesting monograph (Beiträge zur Kenntniss der Saponinsubstanzen, R. Kobert, Verlag Enke, Stuttgart, 1904) this has been very clearly shown.

This monograph embodies the results of the work of Kobert and his pupils on the derivatives of the Saponaria and allied families, which results have been published in the reports of the pharmacological institutes at Dorpat and at Rostock. The work has been in progress since 1883.

Kobert's attention was called to these substances through several remarkable properties. Owing to their toxicity they have been used since the time of Aristotle and perhaps by the Phoenicians to catch fish. Extracts of plants containing these substances when placed in water kill fish with great rapidity.

They have the property in solution of keeping solids and immiscible liquids in suspension for an almost indefinite period, and as such have been used in pharmacy for preparing emulsions.

As their name implies they fulfil the function of a soap. Their solutions have been used in domestic and technical practice for washing fabrics which will not withstand the action of soaps. They also produce a lasting foam similar to that formed by soaps and have been used in beverages to effect the foaming so much desired in soda waters and allied drinks.

Certain members of the family, notably the sarsaparillas have obtained much renown in popular practice as antisyphilitics. Lastly and very importantly, they have a marked hemolytic action and, when introduced into the circulation, are exceedingly toxic to all classes of animals. It is to this last property that Kobert especially calls attention.

The hemolytic action of the different members of the group varies within wide limits. Whereas, the sarasaponin obtained from sarsaparilla induces hemolysis in solutions of 1-125,000, the guaiac saponic acid from

guaiac wood requires a concentration of 1-10 to effect laking of the corpuscles.

Two other important members of the group stand midway. These are *quillaya* sapotoxin which is in common use for foam making purposes and which has a hemolytic action 1-10,000 and *chamælirium* 1-700. This latter is the substance which Kobert provisionally suggests to replace the quillaya bark. By means of chemical reactions which are more or less difficult to effect on a commercial scale it is possible to reduce the hemolytic power of the saponins. Unfortunately this loss in toxicity is accompanied by loss in foaming and the changed saponins are useless for commercial purposes.

The toxic effect of these substances on the organism varies according to the animal used, the manner of introduction, and the specific saponin employed.

A certain relation does exist between the hemolytic power of the saponins and their toxic property, but this relationship is not a simple one. In non-lethal doses the hemolysis occurring in the blood does not always produce a hemoglobinuria. Larger doses do, however, produce a marked hemoglobinuria leading to a fatal issue. The lethal dose of these substances is small in every case. For quillayic acid and sapotoxin the amount is one milligram per kilo, and even less. For fish one part in 300,000 of water is lethal. On the other hand, it is well known that doses of 0.1 to 1.0 gram per os have been taken by individuals with intact gastric and intestinal mucosæ without ill effect.

In suitable cases, however, the ingestion of doses under 0.1 gram gives rise to a highly dangerous condition leading to inflammation and hemorrhage. Kobert is, however, not prepared to say that the hemolysis is the simple cause of death, but believes also that the saponins affect the nervous system.

It is directly in this connection that the work of Kobert is of interest to the clinician. In the treatment of alcoholic inflammations and in inflammatory conditions of the digestive tract it is the custom to allow the use of artificial lemonades and non-alcoholic drinks. It is quite possible under these circumstances to permit the ingestion of as much of the active principle of these foam-creating substances as 0.1 to 1.0 grams per day. It can well be understood that this may cause inflammatory symptoms, the etiology of which may remain dark for some time.

Moreover, in the summer when large quantities of soft drinks are consumed, with at the same time an increased tendency to intestinal inflammation, the use of beverages containing the saponins is doubly contraindicated.

Kobert suggests that in the manufacture of emulsions and non-alcoholic drinks the use of saponins, especially quillaya bark be absolutely prohibited.

As a substitute he proposes either chamælirin, or better, the saponin obtained from guaiac. Other questions such as immunity against these substances, the specific action of cholesterin and the lecithins, which are more of interest to the biologist are taken up.

C. G. L. WOLF,
Cornell University Medical College.

New York, April 2, 1904.

ANAESTHOL.

To the Editor of THE MEDICAL NEWS:

DEAR SIR: We beg to state that the use of the name of Dr. Willy Meyer, of New York, upon the label of the new anesthetic "Anaesthol" was introduced without his knowledge, though in entire good faith upon our part.

At his request the label has been changed and, in order to protect the medical profession against unreliable imitations, it will henceforth bear the name of Dr. Weidig, the originator of the new compound.

CHAS. COOPER & Co.,
194 Worth St., New York,
Sole Manufacturers.

LEHN & FINK,
120 William St., New York,
Sole Selling Agents.

March 29, 1904.

SPECIAL ARTICLE.

THE MUTUAL RELATIONS BETWEEN TOXIN AND ANTITOXIN.*†

BY PROFESSOR PAUL EHRLICH, M.D., LL.D.,
OF FRANKFORT-A.-M., GERMANY.

INTRODUCTION.

THE importance of practical and theoretical study of immunity. Influence of the side-chain theory. Cellular origin of antibodies. Relations between the constitution and distribution of chemical substances and their pharmacological action. Complexity of simple functions.

Opposing views. Criticism of their experimental basis eliminates errors and reverses their significance. Importance of hypothesis to scientific advancement. Heuristic value of theory of immunity. Utility of succinct nomenclature and symbolic representation (algebra, chemistry).

HISTORY OF SIDE-CHAIN THEORY.

Studies upon the localization of various dyes and their relations to cellular chemistry (Methylene-blue, Neutral-red). Production of immunity with poisonous proteids; —independently of Behring (ricin, abrin, robin). Immunity not only bacterial, but a general principle. Quantitative studies on augmenting immunity and determining its degree. Older obscure conceptions of the relations between antitoxin and toxin (union, destruction, cell-protection). Experiments in vitro eliminate obscurities of those on animals. Chemical nature of union demonstrated. Warmth and concentration hasten union.

TOXOIDS.

Difficulty in applying purely chemical conceptions in the case of diphtheria toxin. Law of equivalence apparently violated. Definitions of immune unit; technical toxin-values, lethal dose ("Dosis lethalis"), limit zero ("Limes null"=Lo.), limit death ("Limes Tod"=L†). Different lots of diphtheria toxin though neutralized by a single immune unit contain different numbers of lethal doses. Investigation shows that upon standing the diphtheria toxin loses toxicity, but retains undiminished its affinity for antitoxin. The toxin molecule is quantitatively transformed into non-poisonous toxoid. Chemical illustration (anilin and sulphanilic acid). The simplest explanation of toxoid formation rests upon the assumption that the toxin-complex contains two groups of different functions: (*a*) Haptophores, by which the complex enters into chemical unions; (*b*) Toxophores, which occasion toxic action. Behring's objection, exemplified in hydrocyanic acid, not justified, because of the simple constitution of that poison. Complex organic compounds have repeatedly been shown to contain groups which confer definite properties upon the whole molecule. Anesthesiophore function of the benzoyl group in cocaine; functions of the chromophore and auxochrome groups in dyes; color reactions of proteids due to definite groups (tyrosin, tryptophan, etc.). Evidence of this complex

* Abstract of the first Herter Lecture, delivered before Johns Hopkins Hospital Medical School, April 12, 1904.

† This paper will be published in full in a subsequent issue of the MEDICAL NEWS.

character of toxins also furnished by studies of hemolysins and bacteriolysins, which have their origin in the union of an amboceptor and complement and are analogous to toxins, the amboceptor representing the haptophore and the complement the toxophore group. Kyes' studies on cobra-lecithid.

SIDE-CHAIN THEORY.

Haptophore Group.—The conception of the duplex nature of toxins, etc., forms the basis of the side-chain theory. Views regarding protoplasm. Fundamental nucleus and side-chains (receptors). These receptors subserve normal assimilative processes which are of synthetic character. Only those substances can be chemically incorporated with the protoplasm (assimilated), which possess a grouping most closely related to some constituent of the cell, fitting into its constitution as a key into a lock. The toxins represent, to a certain extent, toxic foodstuffs.. It is mere chance whether they encounter suitable receptors in the cells of a particular animal species or not, as is shown by the irregularity in the action of given toxins in the animal kingdom (botulism). Elaboration of the side-chain theory. The antitoxins are receptors, produced in excess, and liberated from the cells. Appearing in the fluids they unite with the toxins for which they have specific affinity and thus protect the cells which have receptors of similar affinity from damage (analogy to lightning-rods). Not only toxins, but also toxoids, call forth antibodies. It is therefore chiefly the haptophore group which causes the cell-reaction, yielding antibodies by occupying the specific receptors. It is doubtful whether this cell reaction is purely regenerative. The great disproportion between the amount of toxin introduced and the quantity of antibodies obtained points to a concomitant cell-stimulation (Bindungsreiz of Wassermann). This is supported by the fact that a single immunization with suitable bacteria (*e.g.*, cholera) or toxin (*e.g.*, that of diphtheria) may induce an abundant production of antibodies.

EVIDENCE IN FAVOR OF THESE THEORETICAL CONCEPTIONS.

1. The demonstration of specific receptors in organs susceptible to a particular poison. Wassermann's experiments: union of tetanotoxin with cerebral tissues. Disproof of opposing views of Behring and Besredka. Locking of native and experimental hemolysins by susceptible erythrocytes.

2. The demonstration by Pfeiffer that during the latent period, before free antibodies appear in the serum, they may be obtained from the bone-marrow with salt solution (loosely bound, partially liberated receptors).

3. Demonstration of the presence of receptors produced and fixed in definitely localized tissues. Increased abrin-locking by the immunized conjunctiva (Römer).

4. Local production of specific precipitins for maja-albumin after intraocular injection (v. Dungern).

5. All attempts to produce antibodies with alkaloids, antipyretics and antiseptics have failed. These substances do not enter into the composition of the protoplasm, they encounter no suitable receptors and therefore fail to call forth a specific antigenetic reaction.

TOXOPHORE GROUP.

The toxophore group need not necessarily be simple but may comprise various constituent groups which may be identical or different. Illustrations from alkaloidal chemistry; strychnine contains two oxygenated radicles both of which produce convulsions and the drug owes its extraordinary toxicity to a combination of the two. Substances of the filicic acid series are active in proportion to the number of filicic butanon groups they contain. Ricin probably contains two toxophore groups, one agglutinating erythrocytes, the other causing its general toxicity. Three varieties of toxoids may be obtained from ricin, one non-toxic but agglutinating, one toxic but not agglutinating; both of these are incomplete toxoids. The third, complete, is neither toxic nor agglutinating (Tarobi). Tetanotoxin and diphtheria toxin also appear to contain various toxophore groups. In the former there may be a lethal toxophore group and a morbific group; and in the case of diphtheria we may have to distinguish between complexes which cause the chronic effects and those occasioning acute manifestations. It is possible that certain partial groups act more powerfully on certain animal species than on others, and this may explain the observations emphasized by Behring that modified toxins meet with a range of susceptibility in the animal kingdom different from that of the original, unmodified toxin. Of practical importance is the question whether for the rapid production of antitoxin it is more advantageous to use only toxoids, or whether the presence of partial components of the toxophore groups exerts a more favorable cell-irritation.

The action of the toxophore groups is generally slow. Since the intravenous injection of toxins is rapidly followed by their locking in the tissues and disappearance from tne blood, the incubation-period, which in the case of diphtheria *toxones* may last for weeks, can only be explained by the slow action of the toxophore complexes. This is further exemplified in the hemolysins. Other factors may enter into the production of a period of incubation (studies of Hans Meyer and of Roux on tetanus). It is difficult to express definite views regarding the mode of action of the toxophore groups. Hueppe's hypothesis; experimental evidence wanting.

RECEPTORS. SUSCEPTIBILITY TO TOXINS. RELATIONS TO METABOLISM.

The receptors of the cells are constituents of the protoplasm possessing a certain independent individuality, as is shown by the possibility of causing their augmented reproduction. In respect to the toxins they act as localizers or condensers and may from an infinitely dilute solution occasion a concentration of toxins in particular cells similar to the concentration of picric acid which takes place when wool is immersed in a dilute solution. Susceptibility to toxins may be divided into the following varieties:—

1. Great susceptibility. Toxophilic receptors exclusively in vital organs. Antitoxin production very difficult because of damage to cells, only possible through use of toxoids (guinea pig or mouse and tetanus).

2. Slight susceptibility because of wide distribution of toxophilic receptors in indifferent tissues, *e.g.*, connective tissue, which lock the greater part of the toxins, and thereby protect more important tissues (fowl or rabbit and tetanotoxin).

3. Insusceptibility, though toxophilic receptors be present, because toxophore groups do not act on protoplasm. Abundant production of antibodies. Rare condition (crocodile and tetanotoxin).

4. Insusceptibility through lack of toxophilic receptors. Numerous examples clearly established (crotin, arachnin, specific hemolysins).

Definite receptor-complexes are associated with definite forms of metabolism. Uniform metabolic processes imply uniform receptor-complexes and therefore a uniform susceptibility to toxins (diphtheria toxins and guinea-pigs; tetanotoxin and mice). Individually varying functions reveal themselves in extraordinarily variable susceptibility (*e.g.*, crotin and rabbits). The embryonic erythrocytes of chicks possess no receptors for arachnolysin and are therefore not destroyed by this toxin. Immediately after hatching the development of susceptible erythrocytes begins.

The study of the receptors has been of particular im-

portance in elucidating the processes of assimilation. Former methods applied to damaged cells were not sufficiently refined. Isolated receptors obtained by immunization make an accurate study of assimilation and katabolism more approachable. The reproach brought forward by some controversialists that the theory of receptors should also explain regeneration is extravagant. It is an advance to be able to isolate certain wheels in the complex mechanism of the assimilation-processes and to ascertain their utility. The actual motive power is not revealed and the problem of regeneration of living matter will long remain unsolved.

The demonstration that erythrocytes possess extraordinarily numerous and various receptors is particularly important. It indicates that these corpuscles, in addition to their function as oxygen-carriers, play an important rôle in metabolism in storing intermediary bodies.

Investigation has been greatly aided by a knowledge of the receptors, since they can be used in the analysis of animal and vegetable poisons to separate them into partial-toxins having different haptophore groups. Thus it is possible by specific locking with specific antibodies to analyze snake poison into neurotoxic, endotheliotoxic and two hemotoxic components. Of the latter, one agglutinates, and the other, through the formation of lecithid, hemolyze the blood (Meyer, Flexner, Kyes). Similar analyses of tetanotoxin and diphtheria toxin are possible. The method is a great advance in a most difficult field of research.

CONCLUSION AND PRACTICAL FORECAST.

The immunization industry which has for its aim the production of sera of highest potency has made marked progress. Sera of much higher antitoxic value than have hitherto been obtained will be the result. The knowledge that the immunity reaction is reduced by too highly toxic treatment of the animals is spreading. An effort is being made to restrict this immune reaction to tissues of slight vital importance (connective tissue) and to protect vital organs from injury. In this direction are the methods of immunization with toxin and antitoxin injected separately or after admixture. Thus an apparently neutralized toxin may cause antitoxin production (Park). This is due, as will be explained in the next lecture, to the presense of ultra-toxoids.

Progress in the production of curative sera is to be expected only when it becomes possible to obtain antitoxins of greater avidity than those now procured. That this is theoretically possible is shown by the investigations of Kyes who demonstrated that through the immunization of rabbits with cobra-lecithid it is possible to obtain an antibody of considerably higher avidity than that obtained by Calmette with cobra venom in horses (antivenin). The selection of particularly favorable animal species and the use of toxins of least avidity or ultra-toxones will, most probably, bring this problem much nearer its final solution.

Origin of Fat in Lipemia.—Perhaps the highest amount of fat in the blood on record was found in a case of diabetes by E. NEISSER and L. DERLIN (Zeitsch. f. klin. Med., Vol. 51, Nos. 5 and 6). The blood obtained by venesection was chocolate colored and contained almost 20 per cent.; the urine almost one per cent. and the heart-blood after death 24 per cent. A chemical examination was made of the fat in order to decide its origin; it differed considerably from the fat stored in the organ but closely resembled the fat of the chyle, hence was probably derived from the ingested food.

SOCIETY PROCEEDINGS.

THE AMERICAN ASSOCIATION OF PATHOLOGISTS AND BACTERIOLOGISTS.

Fourth Annual Meeting, held in New York City, April 1 and 2, 1904.

(Continued from Page 718.)

Influence of Salts on Lytic Serum.—Dr. Ludvig Hektoen, of Chicago, in a paper on the influence of salts on lytic serum, said that normal salt solution has always been used in making the necessary dilutions in experimenting with lysins of various kinds and no objection is raised to its use, but by using the same strength of other salts in solution, some of them might be found to modify the activities of lysins, and Dr. Gustav F. Roediger and himself have shown that chlorides of calcium, barium, strontium, magnesium and the sulphates of magnesium and potassium suspend hemolysis by their action on the complement under certain conditions and that they suspend the bacteriolytic effect of human serum upon typhoid bacilli. Manwaring, he said, has shown that certain salts inhibit the lytic action of goat's serum on dog corpuscles, the amount of the salt necessary varying with the amount of the complement in the serum; and that precipitation of the salts from non-hemolytic serum salt mixtures restores the original hemolytic power which may be destroyed by heat, and concludes that perhaps the antilytic action of the salts is due to the formation of simple salt or ion complement compounds that are hemolytically active. Dr. Hektoen presented tabulated results of further observation of the action of other salts on the lytic substances in a variety of sera. Small quantities of many salts, he said, are capable of inhibiting the lytic action of human serum upon typhoid bacilli and dysentery bacilli. With the exception of $MgSO_4$, alkaline earths are most active in producing this result. He found also that some salts are germicidal when used alone, while a mixture of solutions of them with serum forms a good culture medium for the bacteria. Many salts were used which had no marked effect on bacteriolysis. The addition of these salts to the sera inhibits the bacteriolytic action, but does not destroy that property of the serum. Example: A mixture of $SrCl_2$ and serum is a good culture medium for typhoid bacilli, but if $Na_2C_2O_4$ is added to precipitate the strontium salt, the serum again becomes bactericidal. This is true also of strong solutions of sodium chloride. The same solutions that suspend hemolysis suspend bacteriolysis as a rule, so, he said that there is reason to believe that the complement is the point of attack. Dr. Hektoen does not believe with Behring that the bactericidal action of rats' serum on anthrax bacilli is due to alkalinity, but that it depends upon interaction of amboceptor and complement. Attempts to inhibit bacteriolysis by serum by introducing the salts into animals have proved unsatisfactory as yet, owing to the death of the animals due to the immediate action of the salts. Tables showing the results of large numbers of salts upon the sera of various animals showing antibacteriolytic action were presented. He quoted Kyes as having shown that the hemolytic amboceptor of cobra venom is activated by lecithin, with which the amboceptor may form a crystallizable chemical compound. Cobra venom is also activated by constituents of normal serum, but according to Kyes and Sachs, the complement in guinea-pig serum, which activates cobra venom hemolytically, is different and

distinct from lecithin. Series of tabulated results of experiments by Dr. Hektoen supported these conclusions. Human serum was shown to become antibactericidal by the action of disintegrated typhoid bacilli, and the products of autolysis of typhoid bacilli were shown to have antilytic properties due to the effect upon the complement and soluble products of autolysis of typhoid bacilli to hinder bacteriolysis. These experiments showed, he said, that in typhoid infections not only is the complement used up in the course of the bacteriolysis, but that a certain amount is also neutralized by the soluble products of disintegration of typhoid bacilli. Tabulated results of further experiments showed that decreasing amounts of antilytic solutions give increasing lysis with the same quantity of complement or serum, that increasing quantities of complements give increasing lysis with the same amount of salt solution, and finally, that multiple proportions of the amount of complement and salt in a given mixture maintain about the same lytic value. His experiments show that in certain instances an excess of salt solution above that necessary to prevent hemolysis causes laking of some corpuscles. There is strong probability, he said, of great similarity of nature and structure of various complements in various sera and in the same serum, and there are indications of close relationship in the chemicophysical nature of complements. Dr. Hektoen concluded that in small doses of $\frac{M}{8}$ solutions, many salts prevent lysis in red corpuscles and of bacteria by various sera. The same salts inhibit the activation of cobra venom by guinea-pig serum. The soluble substances of disintegrated typhoid bacilli have antibacteriolytic and antihemolytic properties. The antilytic salts experimented with prevent hemolysis and probably bacteriolysis by virtue of their complements; that probably in their actions complements and antilytic salt solutions follow simple physicochemical laws and are closely related in their chemicophysical properties; that amboceptors appear to be unaffected by antilytic salts in quantities sufficient to neutralize the complements and possibly neutralization of complements may play an important rôle in certain infections.

Concerning the Specificity of the Somatic Cytotoxins.—Dr. Richard M. Pearce, of Albany, said an attempt to demonstrate the relative specificity of the various cystolysins produced in the rabbit, by injecting the various cells and fluids of the dog, sera produced by injection of the liver, pancreas, adrenal and kidney free of blood and serum have a distinct hemagglutinative and hemolytic action. The same is true of the sera of animals receiving normal serum and urine. Animals treated with bile develop a serum which is agglutinative but not hemolytic. The nephrotoxic serum has a distinct action on the kidneys; pancreas, hepatic and adrenal sera have no definite action upon the organs for which such is supposed to be specific. Degenerative lesions of the kidney and occasionally of the liver follows the administration of all the sera. Albuminuria was frequently observed. When the organ with the contained blood is used for purposes of injection, the action of the resulting serum is complicated by the hemolysins present and unless this factor is recognized incorrect conclusions may be drawn. Such sera cause hemoglobinemia, hemoglobinuria with, usually, lesions of the liver or other organs due to agglutinated red blood corpuscle thrombi. It is evident, Dr. Pearce said, therefore, that specificity depends upon the clinical (receptor) constitution of the cells and not upon morphological characteristics —a confusion of the virus of Ehrlich and Morgenroth. Many of the results heretofore deduced as due to cytotoxin specific for the cells of various parenchymatous organs are due, instead, to hemoglutinins or hemolysins.

Parasitic Hemoptysis.—Dr. E. R. LeCount, of Chicago, reported a case which had occurred in the practice of Dr. A. D. Mackenzie, of Portland, Oregon, and demonstrated the ova of the *Distoma Westermanni* which he had found in the sputum of the patient. This, Dr. LeCount said, was the first case of hemoptysis of parasitic origin observed in this country. The patient, a native of Japan, presented symptoms and physical signs, other than his hemorrhage from the lungs, which, for a time resembled those of pneumonia. Repeated examinations had been made also for the tubercle bacilli, with negative results. The ova were first found by Dr. Mackenzie and later by Dr. C. W. Styles, of the Bureau of Animal Industry. Dr. LeCount reviewed previous observations in this country of pulmonary infection with animal parasites in the hog, the cat and the dog. He said that the disease is endemic in Japan and that most of the literature on the subject is in the language of that country, that two forms of disease due to the *Distoma Westermanni* are known to occur, the pulmonary and the cerebral in both of which cysts are found. A single worm has been found, usually, in a cyst in the lung and a bronchiole always leads into a cyst. A mucopurulent or hemorrhagic exudation is usually present. In the cerebral form adult worms and ova have been found in the cysts. Dr. LeCount further said that Taniguchi believed that the walls of the cysts were in part formed by the vessels, when embolism occurred in this disease. Ova have been found also in various other parts of the body and in the intestinal contents. According to Katsurada, the average size of the ova was 93.5 μ in length and 57μ in breadth. In Mackenzie's case they were 91.33μ by 55.18μ.

Avian Tuberculosis.—Dr. Veranus A. Moore, of Ithaca, described and illustrated by lantern slides the morbid anatomy and etiology of tuberculosis in fowls. The lesions, he said, are largely found in the liver, spleen, intestines and mesentery, the other organs being rarely found diseased. The tubercle bacilli were found in large numbers in the lesions and pure cultures were obtained. The cultural characteristics were briefly described and Dr. Moore said that the morphology of the organism was found to vary much when grown on different media, being smaller and more uniform in size on blood serum and in Dorset's egg medium longer and containing more granular and involution forms when grown on glycerin bouillon and potato. Fowls inoculated with the pure culture developed generalized tuberculosis, but rabbits and guinea-pigs were not affected by abdominal inoculations. A number of fowls were inoculated with human and bovine tubercle material and others were fed with tuberculous sputum with negative results after four or five months. The difficulty of making a differential diagnosis in living fowls was emphasized. Tuberculin made from human and that made from avian tubercle bacilli had thus far not been successful.

Glioma over the Coccyx.—Dr. F. B. Mallory, of Boston, reported the further history of a case previously presented by him to the meeting of the society in Cleveland, in 1902. The tumor occurred in a woman forty-four years old. It had been noticed

twenty-five years previously, when it was about the size of a hickory-nut. It remained of this size until one year before operation, when it grew rapidly, and reached the size of a baseball. It was not attached to the coccyx and the skin was freely movable over it. A year later metastatic nodules were removed from the right groin. In 1904 she was again operated on and recurrences over the coccyx and in the right groin, and metastases in the left groin were removed. The original tumor, the metastases and the recurrences agreed in gross and microscopic appearances. Each tumor mass consisted of nodules distinctly encapsulated. On section they appeared gray and homogeneous like a sarcoma. There were a few areas of necrosis and of hemorrhage. Under the microscope the structure was that of a carcinoma, namely masses of epitheloid cells embedded in a connective tissue stroma. The peculiarity, however, was that the epitheloid cells in the alveoli had produced a fibrillar intercellular substance which has the chemical reactions of neuroglia fibers. So far as known this is the first case on record of a glioma outside of the central nervous system, or of metastases from a glioma. The type of the neuroglia cells is like that seen in early embryonic life. It is probable that the tumor arose from embryonic remains of the neural canal over the coccyx.

The Blood of Normal Guinea-pigs.—Dr. S. H. Burnett, of Ithaca, said that he had made a careful study of this subject and that in the circulating blood of full-grown, supposedly normal guinea-pigs the red blood corpuscles were found to average 5,276,000 per c.mm. The average percentage of hemoglobin was 94.5. The specific gravity found was 1.053. The average number of leucocytes was 10,897 per c.mm. and that five varieties of leucocytes were found in the peripheral blood, as follows: Lymphocytes cells in which the nucleus occupies nearly all of the cell body of which is strongly basophile and coarsely reticular and was equal in size to the red blood corpuscle or twice its size. The average number per c.mm. is 5,087 or 47.32 per cent. Large mononuclear cells with oval or variously bent and curved nuclei which occupy relatively less of the cell than those of the lymphocyte. The cell body of this variety is faintly basophile and finely reticular. Many of these cells contain one or more vacuales or a rounded body which is often nearly as large as the nucleus. The size of these cells is about twice that of the red blood cell and the average number per c.mm. is 1,090 or 10.05 per cent. Polynuclear cells with polymorphous nuclei, the cell bodies of which contain a moderate number of fine granules which have a weak affinity for acid dyes and are one-half the size of the red cell. Average number per c.mm. 3,257 or 31.52 per cent. Eosinophile cells with polymorphous nuclei usually bilobed the bodies of which contain many coarse circular acidophile granules and are slightly larger than the polynuclear variety. Average number per c.mm. 1,175 or 10.72 per cent. Most cells with polymorphous nuclei and cell bodies containing many strongly basophile granules which are slightly larger than the eosinophile granules. These are slightly larger than the eosinophiles and average 43 per c.mm. or 0.37 per cent.

Varieties of Bacilli Included in the Dysentery Group.—Dr. Wm. H. Park, of New York, said that last summer, when this study was undertaken, it had already been shown by Kruse, Hiss, Martin, Lentz, Collins, himself and others that the bacilli obtained from cases of dysentery differed among themselves in their biochemical and agglutinative characteristics. The object of his investigation, he said, was to see whether all the bacilli belonged to a few distinct types or had endless variations. It can be stated that 90 per cent. of all the cases are due to one or the other of these distinct types, and that most of the remaining ten per cent. of bacilli are very closely allied to one of these types. The variety which was met with in the most characteristic epidemics was usually the Shiga type, which does not produce reddening of the peptone mannite litmus media. The second type actively ferments mannite and maltose in peptone mannite media and produces indol. To this type belong the bacillus isolated by Flexner in Manila in 1900, and that from summer diarrhea in Baltimore, by Duval, in 1902. He obtained this bacillus during the past summer from epidemics at Orange, N. J., Riker's Island and New York City. The third type ferments mannite but not in appreciable degree maltose in pepton media. It also produces indol. This type was first isolated by Dr. Park in Dr. Dunham's laboratory at Seal Harbor, Maine, in the summer of 1902. In the fall of that year it was isolated from cases in the Children's Hospital in New York City by Hiss, Wollstein and Collins. During the past summer it was the most frequently isolated type in New York City and in small epidemics north of the city in Mount Vernon, Tuckahoe, etc.

Dr. Park showed the following table giving the reaction of the members of each type to the serum produced through bacilli of the same type and of the other types:

Serum of animal immunized to

Source of Culture	Shiga Type		Manila Type		Seal Harbor Type	
	1-100	1-1000	1:100	1:1000	1-100	1-1000
Type 1.						
Japan (Shiga)	++	++	—	—	—	—
New Haven (Duval)	++	++	—	—	—	—
Mt. Vernon (Collins)	++	++	—	—	—	—
Type 2.						
Manila (Flexner)	—	—	++	++	+	—
Baltimore (Duval)	—	—	++	++	+	—
New York (Goodwin)	—	—	++	++	+	—
Type 3.						
Seal Harbor (Park)	—	—	+	—	++	++
New York (Hiss γ)	—	—	+	—	++	++
Mt. Vernon (Collins)	—	—	+	—	++	++

It was noted that the serum of an animal immunized to a member of either of the mannite fermenting, indol producing types had considerable common agglutinins for the other type; these two types seem to Dr. Park to be in every way nearer to each other than to the Shiga type. This is true, he said, not only in their agglutination affinities but in their having more common immune bodies. The serum from an animal immunized to one of the mannite fermenting types protecting the members of the other type almost as well as those belonging to its own and that this was true to only a slight extent between these types and the Shiga varieties. The cases of summer diarrhea where dysenteric symptoms were absent had as a rule few or no dysentery bacilli. When present they were almost never of the true Shiga type.

Comparison of Living and Dead Tubercle Bacilli in the Production of Antituberculin.—Dr. Trudeau presented briefly the results of inoculation experiments. He showed three photographs of autopsied animals showing the effects produced by inoculation with living bacilli and with dead bacilli, compared with the control animal. These showed a greater diseased condition in the animals injected with dead bacilli and he said that there was a greater death rate among these and that they died in a shorter time. He concluded therefore that there are greater hopes in the injection of living bacilli, in the production of artificial immunity.

Differences in Precipitins Produced by Tubercle Bacilli.—Dr. Edward R. Baldwin, of Saranac Lake, presented the differences obtained in precipitins from two sets of animals immunized with fresh normal saline extracts of tubercle bacilli and the residue respectively. Well marked precipitation was obtained from the extract serum upon both extract and residue. The residue serum, on the contrary, precipitated only the latter. Multiple precipitins or other antibodies with different affinities are possible results, he said, of tuberculous infection.

Observations with Tuberculins from Different Races of Tubercle Bacilli.—Dr. S. B. Wolbach, of Boston, reported upon work undertaken at the suggestion of Prof. H. C. Ernst and which consisted in the treatment of tuberculous guinea-pigs with tuberculin and in making tests for differences in specificity of tuberculins made from human and bovine tubercle bacilli. The cultures used for inoculations and for manufacture of tuberculins were a human and a bovine culture, isolated directly from human and beef blood serum. The work consisted of three parts: (1) The testing of virulences in which the bovine culture was proven more virulent for guinea-pigs and rabbits, though the human culture was a highly virulent one; (2) in testing the strength of the tuberculins the method of Dönitz was used, consisting in the determination of the maximum dose which will cause the death of tuberculous guinea-pigs within twenty-four hours. The tuberculin injections were given at the time when the guinea-pigs begin to lose weight rapidly. By using each tuberculin upon guinea-pigs inoculated with both cultures it was hoped that differences in intensity of its reaction would be found. This proved not to be the case. The tuberculin from the human culture reacted as intensely upon guinea-pigs inoculated with the bovine culture as with the human culture and vice versa. The method of Dönitz was found to be incapable of yielding quantitative results. It was found that the tuberculins made by Dr. Wolbach were approximately equally active and of greater strength than demanded by Koch, that is, that 0.5 gm. should kill a tuberculous guinea-pig of at least four weeks' standing, in from six to thirty-six hours. (3) The treatment of guinea-pigs with skin tuberculosis. Guinea-pigs inoculated with the above culture by the skin-flap method were used. Guinea-pigs inoculated with both cultures were treated with each tuberculin. Treatment was begun at the end of the first week, three injections per week being given, starting with 0.0125 gm. doses and gradually working up to 0.2 gm. doses. No differences in the reaction and effect upon the duration of life were observed between the two tuberculins. The effect of treatment was to prolong life and in a few instances the ulcers healed as described by Koch. This did not occur with the control guinea-pigs. Dr. Wolbach summed up his conclusions reached as a result of the above experiments as follows: (*a*) That there are no specific differences between the tuberculins made from human and bovine tubercle bacilli. (*b*) That the tuberculin treatment is, on the whole, favorable in its action upon tuberculous guinea-pigs. (*c*) As a result of the autopsies upon the guinea-pigs used and upon many others the decision was reached that there are no essential differences in the diseases caused by the two varieties of tubercle bacilli.

The Effect of Certain Blood Sera (Leucocytotoxic) on the Ameboid Motion of Leucocytes.—Dr. Henry Asbury Christian, of Boston, in the Pfeiffer warm chamber studied the action of various blood sera on the ameboid motion of leucocytes. Natural sera, such as that of the rat, rabbit, dog, goose, frog and salamander, had no effect on the leucocytes of these animals, while that of the hen stopped the ameboid motion of the leucocytes of the dog, which was the only example of a natural leucocytotoxin in the blood found. The serum of animals immunized by injections of spleen, liver and kidney are leucocytotoxic, stopping instantly the movement of the leucocytes of the animals whose tissues were used in immunization. This action was produced by the parenchima of the organs injected and not by the included blood, showing that the leucocytotoxic serum can be produced by the injection of cells not of the leucocyte group. The specificity in action of such sera is, said Dr. Christian, similar to that of hemoglobins.

Experimental Production of Liver Necrosis by Hemagglutinins.—Dr. Richard M. Pearce said that the presence of agglutinated red blood corpuscle thrombi in connection with the focal necrosis of the liver of experimental hog cholera had been demonstrated by Boxmeyer and that he himself had produced in the dog somewhat similar necroses by the injection of a hemagglutinative serum (serum of rabbit injected with dog's corpuscles). This serum in doses 1 c.c. per kilo weight causes in the dog definite focal necrosis in which agglutinative thrombi may be easily demonstrated in the circulating blood a few minutes after the injection of the serum. Other agglutinative sera are that of rabbits receiving injection of dog's bile and may produce similar necroses.

A Simple Method of Isolating from Water, Forms Which Agglutinate with Typhoid Serum.—Dr. J. George Adami described a method devised by Dr. J. A. Chopin and himself. The main objects desired were (1) to employ the maximum amount of the suspected water for culture purposes and (2) to use a large quantity also for purposes of agglutination. The water (*e.g.*, the water from a flowing stream) is collected in sterilized Winchester quarts, holding about two liters. In the laboratory 20 c.cm. of a one per cent. glucose broth is added to each and the Winchesters are then incubated for eighteen to twenty-four hours. Glass tubing of 7 mm. inside diameter is taken in one-half meter lengths, the tubes closed at one end to form elongated test tubes and filed around about one inch from the closed end. Into each of a series of such tubes is placed 10 c.cm. of the incubated water, and now into each is dropped a definite amount of a known typhoid serum. Any form agglutinated by the serum forms a sediment at the end of three to five hours. Then the filed closed end is broken off, the sediment washed with sterilized water, a loopful added to a tube of nutrient broth and from this Hiss, Elsner and neutral red plates are made. The method has brought to light forms which are clumped by high diluting of typhoid serum.

Bacteria in the Mesentery of Normal Animals.—This paper was read for Dr. A. G. Nicholls, of Montreal, by Dr. Adami. The method is easily performed and needs only the magnification given by the one-twelfth immersion lens usually employed, and the presence of bacteria undergoing dissolution can be demonstrated in the rabbit, guinea-pig, cat, etc. It consists of

killing the animal quickly by a blow on the neck, rapid opening of the abdominal cavity under strict aseptic precautions, pulling a loop of the endothelial covering of either side of the mesentery by a sterile swab, cutting out and hardening a small thin piece of the same in formalin, stain preferably by carbol thionin for several hours and careful declorization. If sections of the stomach or intestine be stained similarly it is seen that while at the outer ends of the acini the abundant bacilli stain well and characteristically deeper down they stain only in part and tend to assume diplococcoid forms. Similar diplococcoid forms of degenerating bacteria together with occasional well stained forms are to be seen in the mesentery prepared as above. Most often in the immediate neighborhood of the nuclei of the cells lining delicate lymph and blood capillaries. These may be abundant. Presumably they are carried inwards from the lumen of the intestine by the leucocytes.

Bacillus Agglutinated by High Dilutions of Typhoid Serum; Isolated from Water.—This paper by Dr. O. Klotz, of Montreal, and read by Dr. Adami, described the characters of the form isolated by Drs. Adami and Chopin from water at Montreal which agglutinated with high dilutions of typhoid serum. He compared it with a series of similar forms fermenting various sugar broths and not coagulating milk which had previously been isolated by Carl Sternberg, of Vienna, which also agglutinated with typhoid serum, and called attention to the existence of this group of forms. His, he denominated the *Bacillus perturbans*. It was definitely pathogenic to rabbits and guinea-pigs at first, employing not the strongest sera there seemed to be no difference in agglutinating powers between it and the *Bacillus typhosus*. Later, with stronger sera a human typhoid serum which clumped the typhoid bacillus in dilutions of 1 in 6,200 clumped the *Bacillus perturbans* in dilutions of 1 in 1,550. Similarly a typhoid immune rabbit serum gave complete clumping of the two forms and dilutions of 1 in 4,960 and 1 in 2,480 respectively. Immunizing a rabbit against the *Bacillus perturbans*, its serum agglutinated both the typhoid bacillus and the *Bacillus perturbans* in dilutions of 1 in 2,480. Dr. Klotz said that his observations serve to confirm the conclusions already recorded by other observers that even where a positive result is obtained with relatively high dilutions of typhoid serum it is unwise, not to say mistaken, to regard as specific, the reaction. It is the presence of a typical typhoid reaction plus the clinical symptoms of the case, he said, that must be taken into consideration, and now that typhoid cultures are obtainable in so large a proportion of cases from this blood he suggested that those cultures afford the surest diagnosis. So also in examining suspected water obviously the mere obtaining of agglutination with typhoid serum is not to be regarded as adequate evidence of the existence in it of the typhoid bacillus.

(To be Continued.)

NEW YORK ACADEMY OF MEDICINE.

SECTION ON ORTHOPEDICS.

Stated Meeting, held March 3, 1904.

The Vice-President, Virgil P. Gibney, M.D., in the Chair.

A Consideration of the Ultimate Results of the Bloodless Replacements of Congenitally Dislocated Hip.—This was the paper of the evening, and was read by Dr. John Ridlon, of Chicago.

Dr. H. Augustus Wilson, of Philadelphia, in the discussion, said that after listening to the very elaborate paper of Dr. Ridlon, he felt as if little remained to be said, except possibly with reference to the cases that Dr. Lorenz had personally operated upon in the Jefferson Medical College Hospital in Philadelphia. When Dr. Lorenz accepted Dr. Wilson's invitation to hold a clinic in Philadelphia, there appeared to be no suitable cases for him to operate upon. A notice was put in the medical journals, and in a few days cases came in large numbers, the great majority not congenital dislocation of the hip, but all sorts and kinds of deformities. Twenty cases of congenitally dislocated hips were selected and submitted to Dr. Lorenz. From these he chose a sufficient number to demonstrate his method of treatment applied to the various ages. The results of the nine cases he operated on in Philadelphia are as follows: Three perfect anatomical and functional results. These patients are under two years of age; one a single dislocation, the other double. Three cases have good functional results. By that it is meant that they are so far improved over their former condition as to make the trivial limp apparent only to an expert. This gives 66⅔ per cent. successes. Six out of the nine have good functional results. One was not reduced—a child aged four years, who had been previously subjected to various forms of tenotomy, stretching in bed, extension, had worn a brace a considerable length of time. In this case there was failure to produce a reduction. Lorenz attempted reduction and failed, after almost exhausting his strength. It was put up in typical position, and in six months radiograph showed the hip to be not reduced. The ultimate result was great improvement of function. A double case, in six months, after the original cast was removed, showed apparent typical replacement. The conditions which made it slip were undoubtedly due to the fact that through a misunderstanding on the part of the physician who had charge of the case (it was not under Dr. Wilson's care), of the necessity for the weight-bearing feature emphasized by Dr. Lorenz. This child was kept at rest, sitting or lying in bed. At no time was it taught any method of extending the legs to get the hamstrings in full extension. It did not step on its foot for six months. The muscles of both legs were atrophied from disuse, the hamstring tendons were contracted so that the knees could not be straightened, and that made the joint slip from a very shallow acetabulum. Dr. Lorenz in June last, saw the case and found it necessary to etherize the child and stretch the hamstrings again. Notwithstanding the second manipulation upon the hamstring tendons, both hips slipped. The speaker had been surprised at the low valuation that Dr. Lorenz placed upon the radiographs in cases of congenital dislocation. Dr. Wilson thought they were useful as a matter of record rather than as a test of conditions. The radiograph of several cases showed a deep acetabulum, completely deceiving those interested as to real conditions present, which were found to be filled with cartilage and fibrous tissue. Casually alluding to the results in the 32 cases under Dr. Wilson's observation in Philadelphia, he said there had been no paralysis of any sort, nor disturbance of the circulation. In one case there was temporary edema of the vulva, necessitating catheterization for forty-eight hours; after that function returned. There is a question as to whether we are justified in considering the classification of perfect, anatomical results. Perfect anatomical results do not always give the best functional results, and function is the object always desired. It is clearly impossible to make a new hip that will be anatomically perfect in cases that have been born with abnormal hips, and the highest ideal should be to obtain functional recovery and a functional result is not always obtained in a so-called anatomical replacement. A boy, eleven years of

age, by radiograph and palpation, showed a full, anatomically perfect replacement, but he had rigid, stiff hips which possibly might become limbered up after a while, but were far from a functional recovery. Too fine a distinction is made in classes of cures. If a standard of functional recovery can be formed, a higher percentage of successful results will be attained, and justice will be done more fully to the man who has taught us.

Dr. Bradford, of Boston, said that the subject of congenital dislocation of the hip had been under such active discussion that it deserved a most thorough, scientific and academic consideration, free from the personal prejudice. The congenital dislocations of the hip at the Children's Hospital have been carefully examined and a report has been made of upward of 130 cases, by the Orthopedic Staff of the hospital. This report has been submitted to an independent committee of surgeons who will publish a statement after a careful examination of the cases, and he did not wish to anticipate the report by an earlier presentation of figures. The anatomical facts of congenital dislocation of the hip were formerly not well understood, but after investigations of the last thirty years, following the valuble pioneer work of Prof. Carnochan, of New York, the pathological anatomy is well understood. The surgical indications made clear by the pathology of the affection used to be met to secure perfect cures. It has been demonstrated in many instances by many surgeons, that perfect anatomical cures have been obtained in Europe and this country, and perfect anatomical cures are what all surgeons aim for and obtain in a certain percentage of cases. How large that percentage of cases is, will be determined by further investigation. In the statistics collected at the Children's Hospital, in Boston, based on observations dating back for twenty years, the results were most encouraging in that it appeared that the percentage of absolute, anatomical cures has been steadily increasing. By cures was not meant functional cures, or transpositions, but results by which the head was replaced in the acetabulum with perfect restoration of gait, shown by measurements, by palpation, by observation and by skiagraph record, and it is probable that in the near future these will be the results that the surgeon will expect to attain It was within the recollection of many surgeons that congenital clubfoot, which is practically a congenital dislocation, was looked upon as a deformity in which a satisfactory functional result was considered all that was to be desired. We have arrived at a stage of surgical skill by which a surgeon, if he does not obtain a perfect cure in clubfoot, is prompted to look for some defect in method. Congenital dislocation of the hip may eventually be looked upon as a distortion of a similar class. Relapses occur after congenital dislocations of the hip have been reduced, in a large number of cases. These relapses have been already considered in a paper presented a short time ago before the New York Academy, so the subject will not be again brought up at this present time, although it is one of much interest and importance, and it is at present not yet determined whether the percentage of relapse is greater after reduction by or without incision, but Dr. Bradford entirely agreed with Dr. Ridlon that in operable cases, the manipulative method as demonstrated by Dr. Lorenz was the method of choice. This may not, however, be considered a permanent solution of the question. Improvements in technic were to be expected in this as in other branches of surgery. At present in congenital dislocation of the hip there is a condition which is anatomically well understood. In certain of the older cases, those with bony change, manual reduction is not practicable. In a large percentage of cases in young children, reductions are not only practicable, but possible, and to be expected. In a certain percentage of these cases relapses occur. Relapse, as we understand after treatment more thoroughly, may be expected to become less frequent. At present manipulative methods are to be tried in all operable cases. Where this fails owing to a folding of the capsule in front of the reduced head, incision is advisable. In cases with osseous change, operations upon the bone are to be considered. It would seem that anatomically there is no greater difficulty in the cure of congenital dislocation of the hip than in the cure of congenital clubfoot, and in the next decade, the gentlemen of this Academy will, no doubt, when meeting together, consider congenital dislocation of the hip one of the readily curable deformities.

Dr. Whitman said that from his own experience he could not accept the reader's statistics as representative. Two years ago he had presented before the Orthopedic Section of the Academy ten patients cured by the Lorenz method, some of whom had been treated five years before. These patients were actually cured in the sense that no evidence of the former disability remained. In his opinion in properly selected cases (the younger the patient the better the prospect of cure) 40 per cent. of the cases should be perfectly cured by this method. He did not, however, limit himself to the Lorenz operation, but having failed by that method he would recommend arthrotomy. By this means one might assure himself that the head of the femur was actually within the acetabulum, or if the femur were so twisted as to make permanent apposition impossible one might restore the normal relation by means of osteotomy. Finally the old Hoffa-Lorenz operation might serve as a last resort to assure the stability which was hardly possible without bony support. It was true that the best result by this method could not compare with the perfect cures attained by bloodless reduction. The average result, however, was better than after transposition. He was inclined to think then that when bloodless surgery had found its limit one should supplement it by other surgery, and that by a more comprehensive treatment the results would be greatly improved. Dr. Whitman said that there were different varieties of transposition which had not been recognized apparently, in the statistics presented. One was caused by hyperextension, in which the head of the femur was forced too far forward so that it could be felt and seen directly beneath the femoral artery. In cases of this character the limb remained, when the plaster bandage was removed, in an attitude of abduction and extension; motion could be restored only by persistent manipulation, and in some cases an anesthetic might be necessary to lessen the distortion. Yet, in this class of cases the final result was likely to be good and even perfect because of the permanency of the reduction. If, on the other hand, the head of the femur were just outside the femoral artery the result was usually unsatisfactory in that the shortening was progressive until the head came to a resting place beside the anterior superior spine. In only one class of cases could such transpositions be regarded as a good result. If, for example, one had transformed a bilateral posterior into a bilateral anterior displacement the contour of the body was improved and the symmetrical disability was markedly decreased, but if in such a case one side were actually cured and the other transposed, the surgeon might be accused of injuring the patient because the swaying gait had been changed to a noticeable limp. In such a case one should always perform the open operation with the aim of assuring stability, even at the expense of a part of the range of normal motion.

Dr. Jacobi asked the earliest age at which a patient

should be operated on when found to have congenital dislocation of the hip. A case might be discovered when a baby was but a few months old; is any operation in order at this time? Usually cases are not discovered at this time but occasionally they are.

Dr. Newton M. Shaffer, in the discussion on Dr. Ridlon's paper, said, while not agreeing with all his conclusions, the paper presents many valuable facts, and however the statistics he presents may be regarded, they form an intelligent basis and a comprehensive one for judging of the Lorenz operation and its results. He regrets his unpreparedness to give a satisfactory analysis of the results obtained in the patients coming under his observation, but preferred to make reference to those only who have been under his care, for a longer or shorter time, at the State Hospital. These were four in number, all operated upon by Dr. Lorenz, either at the Cornell Clinic or at the hospital. The lessons conveyed by a study of these cases—their behavior under treatment—their progress after the gypsum splint was removed—and the results thus far obtained, are most interesting. But at this date, about fifteen months after the operations, it is impossible to state the ultimate results—and it may be years before this can be definitely determined. In all these cases—and all were apparently successfully reduced—the tendency to the condition known as the "anterior transposition" was marked. He thinks that Dr. Ridlon's statement that this is due, in a large measure, to the conditions produced by the tearing of all the resisting tissues, especially the muscles and nerves, is correct. In the after-treatment of this condition one should study the "adaptive muscular conditions" as he has termed it, more closely. Normal muscles shorten and lengthen as opportunity is given, as, for instance, in the acquired talipes equinus associated with the shortened leg in hip disease. In infantile paralysis, the shortening of the unparalyzed muscles is always marked. In lateral curvature, the same thing is observed. Muscles lacerated, as in this operation, for instance, the adductor group, by the force necessary to reduce a congenitally dislocated hip may be so far injured that it may be years before they can regain their normal contractility, if they ever do. Add to this a nerve injury and the condition becomes more complicated. Studying the results which have come under his observation, he should, in the future, give these muscles a much longer time to recuperate, before discarding mechanical protection. In other words, after the plaster-of-Paris splint is removed, a simple steel support should be applied, as for instance, in extensive infantile paralysis, embracing the pelvis with a conventional pelvic band controlling the entire limb to, and involving the foot, with anteroposterior motion, only, at the hip, knee and ankle, with or without perineal pads, as indicated. This would place the femur and the hip under the control of the surgeon and prevent any "anterior reposition" and the "weight-bearing" principle could be scientifically applied, while the patient walks about—with the head of the femur in the acetabulum. Massage, etc., could be used to restore the lost muscular power. He has applied this treatment to two of the patients now under observation at the State Hospital—who are doing well. He regrets he did not apply it to two others who have done badly since they left the hospital, with apparently perfect reposition.

Dr. V. P. Gibney said the presentation of the subject by three or four men who had worked so lately in this line, and especially one gentleman who had come from the city of Chicago with a very well prepared paper and who had given such carefully compiled results, led him to refrain from any discussion. He thought his colleagues would agree with him in saying that the cases operated upon at the Hospital for the Ruptured and Crippled are hardly ready for presentation of final results. In the last Annual Report of the hospital he had given a brief résumé of results, though far from final. With the opportunities afforded at the hospital for protecting the joints and for operative interference, he thought all concerned felt that it is best to reserve statistics until a later date. He believed the results would compare very favorably with those shown by Dr. Ridlon.

Dr. Ridlon said, in answering Dr. Jacobi, that the earliest case of congenital dislocation of the hip he had had anything to do with was one of seventeen months. There can be no question that the earlier one operates, the easier it is to make replacement and the less the injury. On the other hand, the earlier the operation, the more difficult the retention because the delicate baby's skin does not bear covering as does that of an older child. A baby wets the plaster splint. One case operated on by him, which he reported on as having relapsed because the splint was wetted and bent (the child flexed and the head went out backward) was operated on by Lorenz. The result was anterior and supracotyloid displacement. It is an annoyance to have to change a plaster splint, reeking with urine, almost every week for eight months. Earlier than eighteen months, one does not recognize the dislocation; generally not until the child has walked. In one case a child had clubfoot and congenital kyphosis, coming for treatment when six weeks old; it was not known that she had a dislocated hip until she was nearly three years old. From two to four years is the period of choice—when the child is old enough to be cleanly. As to Dr. Whitmans remarks, that the greatest thing to be desired in the treatment of congenital hips would appear to be stability; the speaker would not agree. He had the pleasure of examining cases operated on and cured by Dr. Whitman in 1900. They were certainly replaced and certainly stable, also certainly stiff by the cutting operation. Dr. Ridlon did not consider a stiff hip in a good position, as good for a patient to use or as desirable as a hip with which he can walk, with just a little limp, which can be bent to a sitting position. He thought it best to get a functional result, even if not a perfect anatomical replacement. Dr. Whitman also spoke of different transpositions. Those cases in which the head has lain back of the artery, Dr. Ridlon had called extreme anterior transposition in contradistinction to those lying to the outer side of the artery and on a level with the acetabulum as shown by the X-ray; where the head could be felt but not seen, while those back of the artery can be seen as well as felt by him.

BOOKS RECEIVED.

The MEDICAL NEWS *acknowledges the receipt of the following new publications.. Reviews of those possessing special interest for the readers of the* MEDICAL NEWS *will shortly appear.*

PREVENTIVE MEDICINE. 12mo. Maltine Co., Brooklyn, N. Y.

ATLAS AND EPITOME OF OPERATIVE GYNECOLOGY. By Dr. O. Schaeffer. Edited by J. C. Webster. 8vo, 138 pages. W. B. Saunders & Co., New York, Philadelphia and London.

SYSTEM OF PRACTICAL SURGERY. By Profs. E. von Bergmann, P. von Bruns and J. von Mikulicz. Translated and edited by Drs. W. T. Bull and W. Martin. 8vo, 936 pages. Illustrated. Lea Brothers & Co., New York and Philadelphia.